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FROM SAVAGERY TO CIVILIZATION

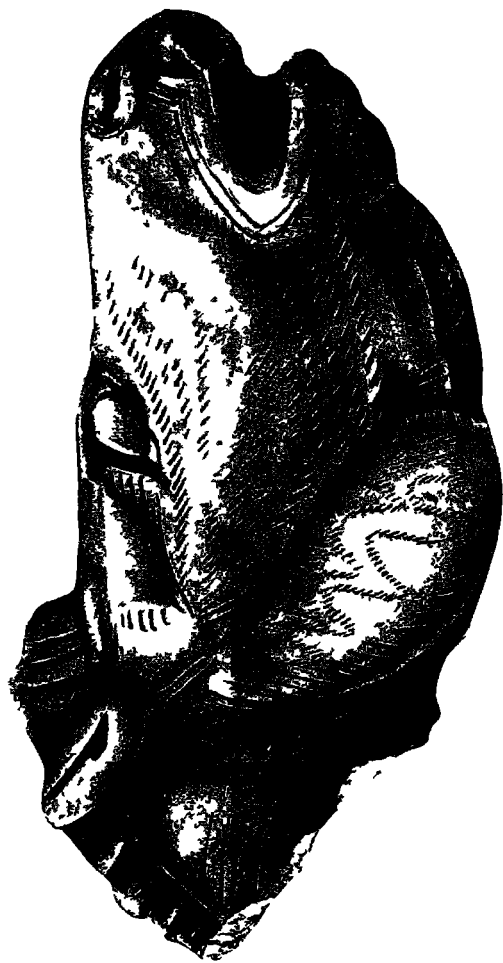


Plate I Carved Horse's Head (Magdalenian) from Mas d'Azil, France. ($c \frac{2}{1}$)

FROM
SAVAGERY
TO
CIVILIZATION
BY
GRAHAME CLARK

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PREFACE

THIS small book is concerned with tracing the main steps by which man has emerged from the brutes and attained to civilization. Drastic selection and a broad treatment have been necessary to encompass this within the allotted space. I have felt it necessary to devote a chapter to man's evolution as an organism, if only to emphasize the unique character of his biological inheritance, on which all his achievements in the realm of culture ultimately rest. In defining the main stages of his cultural evolution from Savagery through Barbarism to Civilization, I follow the definitions advanced by E. B. Tylor,¹ though it has been necessary to modify these in some respects to accord with the facts disclosed by two generations of dazzling archæological research.

Since Tylor wrote, the search for palæolithic man has been extended from Europe to much of Asia and Africa; the mesolithic has emerged to bridge the gap between the palæolithic and neolithic eras; the meagre but significant settlements of the earliest farmers have been brought to light in Egypt and western Asia; and the antiquity of life in cities has been demonstrated by excavation in the Near East. Today, when the main outlines of human development rest on a solid basis of ascertained fact, we can afford to recognize that many of the broad speculations of our Victorian predecessors were in essentials true. If we now require truth to be tested on the touchstone of history, we can admit the illuminating power of a conception such as that of evolutionary progress.

So as to compensate in some measure for compression in the text, I have appended a short list of works for further reading, numbered consecutively. Articles in learned journals have only been listed where the information is not more readily available in book form, and so far as possible

only works printed in English have been chosen. In footnotes, the first number of the reference relates to the number of the item in the list, the second to the page.

The book has been written under wartime difficulties over a longish period, much of it in trains. The text has been read by my wife and by the editors of the Series and I have profited much from their comments. Treatment and emphasis have each been influenced by the fact that the present volume is the first of a series: the stress laid on the earlier stages of the story is intentional (Fig. 1), and barbarism is purposely treated only in its primitive form.

J. G. D. C.

Cambridge, *June* 1944.

ACKNOWLEDGEMENTS

It is a pleasure to acknowledge the careful scrutiny of Chapter I in page proof by my colleague, Mr. J. C. Trevor, newly returned from war service. Many of his suggestions as to terminology and points of fact have been adopted, but responsibility for any views expressed is my own.

Thanks are also tendered to the Cambridge University Press, the Carnegie Institution of Washington and Messrs. Methuen for permission to reproduce Plates III and IV and the drawing from the original Plate (Fig. 15) of the Female Figurines.

the history of man's forebears that many of his outstanding characteristics originated. Life in the trees favoured the development of sight and hearing at the expense of smell, which hitherto had dominated behaviour, and greatly enhanced the importance of dexterity and skilled movement. Comparison of the brain of the tree-shrew with that of its more conservative cousin the jumping shrew (Fig. 2), illustrates how drastically the change of habit promoted the capacity for vision at the expense of smell. Among the tarsiers (Fig. 2), diminutive tree-dwelling mammals about the size of a small rat, the process was carried a stage further: the reduction of the snout allowed the eyes to move round to the front of the face and so permit 'the visual fields of the two eyes to overlap',¹ an essential preliminary to stereoscopic vision. The transition from the tarsiod to the true monkey is marked by the achievement of this vision in depth, which added so enormously to the capacity of the animal to appreciate the true nature of its surroundings. It has been well said that 'vision is the foundation of our intelligence and the chief source of our knowledge'.²

Stereoscopic vision, and the enhanced mental appreciation of objects which it engendered, 'stimulated a curiosity to examine and handle them', while at the same time making it easier to control the accurate use of the limbs. It may well be that this mental curiosity helped to promote the assumption of erect posture and the consequent freeing of the hands.³ Yet it is significant that some of the hominids lowest in the scale of mental development appear already to have adopted the upright stance, suggesting that man stood upright while his brain was still relatively undeveloped. What is quite certain is that the new posture itself assisted the growth of the brain. The process of standing upright was not attained at once (Fig. 3). Already in the arboreal stage the anthropoid apes marked themselves off from the

¹ 10, 143. ² 11, 37. ³ 10, 42.

monkeys by carrying their bodies at right angles to their plane of movement in the branches rather than horizontally, though among the apes the arms continued to play an



Fig 3. *Skeleton of Homo sapiens (e) compared with those of the apes. (a) gibbon, (b) orang, (c) chimpanzee, (d) gorilla. Note the difference in stance and in the proportions of the limbs. (After Huxley.)*

important part in movement, in the case of the gibbon and the orang a bigger one than the legs. It was the descent from the trees and the adaptation of the earliest hominids to life on the ground that, coupled with the progressive growth of the brain and the stimulus of improving vision, led finally to the specialization of the limbs.

Comparison between modern man and his nearest living simian relatives, the larger anthropoid apes, reveals that underlying agreement that we should expect were evolution true: T. H. Huxley was able to maintain the celebrated thesis 'that the structural differences which separate Man from the Gorilla and the Chimpanzee are not so great as those which separate the Gorilla from the lower apes'.¹ Yet, impetuous though he was, Huxley was careful to emphasize 'that every bone of the Gorilla bears marks by which

¹6, 144.

might be distinguished from the corresponding bone of a man'.¹ Indeed the whole anatomy of man is influenced by that upright posture which is one of his distinguishing characteristics. Whereas the apes are in a sense intermediate between quadruped and biped, the whole arrangement of the human body is attuned to the specialization of the legs for running and walking. The dominating fact of man's carriage is his achievement of balance, whereby with the least muscular effort he can maintain himself erect. Thus the curves of his vertebral column have been accentuated so as to present an S-shaped profile and provide a pivot for his head, which, instead of being suspended from one extremity, is firmly balanced at its apex. Similarly, the pelvis has broadened to give support to the intestines in their new position.

The influence of erect posture on the development of the brain was profound. The new poise of the head was accompanied by a moving forward of the foramen magnum, the opening at the base of the skull through which the spinal cord passes to the brain, and at the same time rendered superfluous much of the muscle at the back of the neck formerly required to maintain the head, both developments which favoured the expansion of the brain. The growth in manual dexterity made possible by the release of the hands from a direct share in movement, not only refined the organs available for using tools, but contributed directly to enriching the structure of the mind that devised them. Improvements in the ability to handle materials combined with advances in visual definition to promote that exact knowledge of his surroundings and of the shapes, sizes and textures of objects, without which man's unique capacity for reason and understanding could hardly have been developed. Again, the more purposeful employment of the hands for feeding diminished the call on the jaws and teeth and so relieved the skull from muscular pressure,

¹*Ibid.*

while at the same time altering the whole balance of the head. Side by side with a great reduction in the size of the jaws and teeth, we may note the absence of the prominent

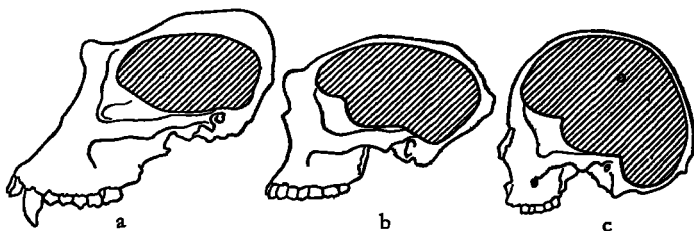


Fig. 4. The growth of the brain from ape to man: (a) Gorilla; (b) *Pithecanthropus erectus*; (c) *Homo sapiens*. Note the enlargement of the cranial cavity (shaded) and the diminution in the size of the face and teeth. (After Weidenreich.)

ape-like canines, together with modifications in the size and character of the brow ridges, which acted in part as buttresses supporting the upper part of the face against the pressure of mastication.

By far the most striking and significant differences in the anatomy of man and ape are found in the brain itself (Fig. 4). On the score of size the contrast is palpable. The average capacity of the brain of the modern European (c. 1500 c.c.) exceeds by twice that of the largest ape brain ever recorded (650 c.c.) and by more than three times that of the average gorilla (450 c.c.), the closest living relative of man extant and one exceeding him twofold in bulk of body. Again, the convolutions of the gorilla's brain, while resembling those of man, are of a simpler order. The parietal and prefrontal regions of the brain and the lower part of the temporal area, are all more powerfully developed in man than in the apes. Significantly, it is precisely these which attain their full development latest in the human child.

If the mental transcendence of man is evident, it is not quite a simple matter to define exactly the limits of animal intelligence. The possession of articulate speech can,

however, be accepted as a criterion of humanity at once decisive and of immense significance.-As E. B. Tylor expressed it, 'it is not merely that the highest anthropoid apes have no speech; they have not the brain-organization enabling them to acquire even its rudiments.'¹ The consequences of articulate speech have, indeed, been incalculable: it is to speech that man owes the possibility of transmitting experience and so accumulating a social heritage, and it was by means of speech that he has been able to mould the very apparatus of his thought and give expression to those abstract ideas and concepts that Locke considered the hallmark of human understanding. The attainment of speech beyond crude emotional cries, and perhaps a few imperative verbs, implies a refinement of the sense of hearing and the acquisition of sufficient discrimination in relation to objects to make it both feasible and valuable to devise specific names for them or for their qualities. These same physiological refinements underlie the appreciation of beauty, another distinctively human attribute and one that, operating through sexual selection, must have helped to promote the development of secondary sexual characteristics, the differentiation of races and the general refinement of the human body.

In the realm of behaviour the outstanding difference between man and the apes is, of course, that one possesses and the other lacks the capacity for culture. Animals, and in particular the great apes, can be taught a variety of tricks and the latter can be schooled in performing the motions of tool-using, but the understanding use of tools and their purposive devising is a characteristic of man alone, and the tool, intervening between impulse and activity, in turn fostered thought. The chimpanzee, although described as the most accomplished of the apes in the use of tools, fails to distinguish between a whole and a part if these are spatially connected, as when a table is placed against a wall, and is deficient in elementary statics. Equally, 'the gorilla

can manipulate human tools, but he uses them destructively.¹ The social effectiveness of man's technical capacity was enhanced beyond measure by his ability to share his discoveries with his fellows, hand them on to posterity and so accumulate experience over generations.

Another distinction of importance concerns diet: whereas apes and monkeys are mainly vegetarian, man will eat anything, consuming animal flesh as well as plant food. The omnivorous habit of man is a particular example of that superior adaptability, which Elliot Smith has attributed to a greatly enhanced power of recording the impressions of his senses and of profiting from experience. 'No animal has such a power of adapting itself to different environmental conditions, nor such a bewildering number of appetites or tastes'.² Historically the change of diet is associated with the abandonment of the forests by man's immediate forebears. Spreading into various habitats man's predecessors acquired an omnivorous diet, and, being omnivorous, have been free to wander, thus extending the range of external stimuli and at the same time promoting the diffusion of culture and the contact of varying cultural traditions. The mere fact of enlarging the scope of his diet has affected profoundly both the economic and the social conditions of human life. Whereas among the apes and monkeys every individual, male and female, young and old, has to forage for its food in common, the subdivision of economic functions has ever been a hall-mark of human society. The acquisition of carnivorous tastes necessitated a form of activity for which adult males were peculiarly adapted, and so laid the basis for that economic specialization of the sexes which until modern times dominated society. Against a background of women and children engrossed, like their simian forebears, in the collection of vegetable food, there emerged the resplendent figure of man the hunter, prototype of man the warrior!

* 14, 209. ² 35A, 8.

The contrast is even more marked in the case of social organization. Among the apes and monkeys the nucleus of society is the male overlord and his females and their young, an arrangement based on the possibility of breeding all the year round and one which distinguishes most sub-human primates from the lower mammals, whose narrowly restricted breeding season causes the female and her young to constitute the only stable unit. With primitive man, on the other hand, the monogamous family of father, mother and children became the basis of social organization. This important change in social structure went hand in hand with the change in diet and the sexual division of labour which this entails. The monogamous family was thus under primitive conditions a necessary consequence of the economic partnership of the sexes. But there was another reason for the change. The institution of the monogamous family gave much more effective protection to the young than that in vogue among the apes and monkeys, and the human young was peculiarly in need of protection. During the years of infancy and adolescence the children even of the most primitive savages had to acquire, not only physical strength, but a whole intricate apparatus of culture, and the family provided a framework for the process of education which the growing complexity of culture has rendered progressively more important. The contrast between the behaviour of man and the apes has been admirably expressed by Dr. Zuckerman.¹

‘Nothing is known of intermediate social levels that may have existed between that of the sub-human primate and that of the most primitive food-gatherer ever described. At the one extreme there is the monkey or the ape with its harem, frugivorous, without any vestige of cultural processes. At the other extreme is man, usually monogamous, omnivorous, whose every activity is culturally conditioned.’

Yet, the affinity between man and the great apes, despite

¹ 13, 315.

the immensity of the gulf between them, remains the dominating fact in any consideration of his relationship to the lower animals. At the same time we must be careful to avoid the error of imagining that man is descended from the apes as they exist today: at most they are cousins of a staggering degree of remoteness whose lines of descent diverged many thousands of generations ago. Zoologists have expressed this difference by dividing the Primates into two distinct families, the *Simiidæ* and the *Hominidæ*. Like the New and the Old World monkeys before them, the apes branched off from the common stem, became specialized and either died out or survived unaltered in the shelter of their forests down to the present day. It was from the unspecialized, adaptable stock forming the main trunk of the evolutionary tree that the immediate predecessors of man developed.

In reviewing the evidence of the fossil hominids it is important to realize how inadequate is the material available in relation to the length and complexity of the pedigree. Not only is it scanty, but much of it has serious limitations as evidence: sometimes there is doubt as to the antiquity of fossils; and frequently their incompleteness makes possible a number of widely varying restorations. Yet, the tide of discovery flows with ever-increasing strength and already it is possible to distinguish three main stages in the biological development of the family *Hominidæ*:

- (1) hominids, who qualify for inclusion in the family despite their small brains and muzzle-like faces—sometimes called ‘anthropians’, the ‘ape-men’ of popular parlance;
- (2) beings who, while approaching complete humanity, have not yet attained the status of *Homo sapiens*, the ‘hominians’ of certain authors; and
- (3) *Homo sapiens* or fully human man.

NOTE: Some anthropologists prefer a two-fold division,

into 'palæoanthropic' men, comprising (1) and (2), and 'neqanthropic' men (3).

(1) The first of the fossil 'ape-men' was found in the 1890's in the neighbourhood of Trinil, Central Java, by Dr. Eugène Dubois, who called his find *Pithecanthropus erectus*, the ape-man with upright posture. The fossils comprised a skull-cap, three teeth (two of which may, however, be those of an orang) and a thigh-bone. A portion of a lower jaw, which he afterwards assigned to *Pithecanthropus*, had previously been discovered by him at a site twenty-five miles from Trinil. To these Dubois many years later added five more thigh-bones, while between 1936 and 1939 von Koenigswald succeeded in bringing to light at Modjokerto in Eastern Java, the brain-case of a second adult specimen, now known as *Pithecanthropus* II. *Pithecanthropus* I and II agree closely, both having low vaults, receding foreheads and brow-ridges of almost simian appearance. The Sangiran skull, probably that of a female, has a cranial capacity of about 750 c.c. as compared with the 950 c.c. of the original Trinil male. The skulls from Java, then, stand in brain size somewhere between the average male gorilla (450 c.c.) and the average modern male European (1,500 c.c.).

By far the largest assemblage of sub-human hominids is that made in the quarries of Chou-kou-Tien, south west of Peking. Since Davidson Black recognized *Sinanthropus pekinensis* in 1927 on the basis of a single tooth, so much additional evidence has accumulated that we now have remains of upwards of 40 individuals, mainly represented by teeth and fragmentary skulls. The skulls of *Sinanthropus* closely resemble those of *Pithecanthropus* (Fig. 5a), but the more vaulted character of his forehead, the substantially larger capacity of his cranium (male average 1,000 c.c., but ranging to 1,220 c.c.) and the fact that he lacks the diastema or gap between the canine and lateral incisor teeth, an ape-like feature of the *Pithecanthropus* upper jaw

unique in fossil man, have convinced most, although not all, authorities that *Sinanthropus* is the more advanced of the two, and certain of the skulls from Chou-kou-Tien are almost Neanderthaloid in character. Like *Pithecanthropus*,



Fig. 5a. Skull of *Sinanthropus pekinensis* superimposed on that of *Pithecanthropus erectus* (broken line) ($\frac{1}{2}$). (After Weidenreich.)

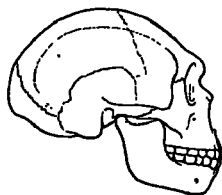


Fig. 5b. Skull and mandible of *Africanthropus njarasensis* ($\frac{1}{2}$). (After Weinert.)

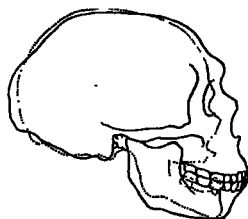


Fig. 5c. Skull and mandible of *Homo neanderthalensis* (La Chapelle-aux-Saints) superimposed on those of *Homo sapiens* (dotted line) ($\frac{1}{2}$). Note especially the contrast in brow-ridges, faces and jaws.

(After Boule.)

Pekin man was found in association with a fauna dating from the Middle Pleistocene. Casts of the crania of both forms show a conspicuous expansion of that part of the brain which in modern man is concerned with the appreciation of speech; the inference, that they were capable of talking, accords with what archæology has to tell of the cultural activities of the people of Chou-kou-Tien. From the asymmetry of his brain it has also been inferred that *Sinanthropus* was right-handed. The superiority of one hand has been attributed to the effects of skilled manual activity in which attention was concentrated on one hand at a time; just why the right hand should have been chosen so much more often than the left, is a matter for speculation. The character of his thigh-bones shows that *Sinanthropus* carried himself comparatively erect and helps to vindicate Dubois' claim that *Pithecanthropus* was entitled to be classified as *erectus*. That creatures with so small a brain should have been standing upright goes to show that 'man had assumed erect posture before the structure of the skull was correspondingly transformed'. The

teeth of *Sinanthropus*, although far removed from the simian level, are notable for their general robustness and for the capacity of their cavities.

The discovery by Kohl-Larsen on the shores of Lake Eyasi in Tanganyika in 1935 of the highly mineralized skull fragments of three individuals resembling *Sinanthropus* shows that anthropians existed in Africa as well as in the Far East. The new form, *Africanthropus njarasensis*, has been studied by Hans Weinert,¹ whose reconstruction of the more complete skull is reproduced (Fig. 5b). The prominent brow-ridges and the brain-case, low-vaulted and of small capacity (1070-1100 c.c.) proclaim the lowly status of *Africanthropus*, but the circumstances under which the existing fossils were found make it impossible to date them geologically.

Finally, in Europe we meet with a form meagrely represented, if securely dated. The jaw discovered in 1907 at a depth of 79 ft. in a sand pit near Mauer, a few miles south-east of Heidelberg, compares in massiveness and lack of chin with those of *Pithecanthropus* and *Sinanthropus*, while the teeth are characteristically robust. Dating from the first interglacial period of Pleistocene Europe, *Palaeoanthropus heidelbergensis* is the earliest sub-human hominid fossil yet discovered.

To summarize the characteristics of the group as a whole, we have to envisage creatures which resemble the great apes more closely than do any other hominids, whether in the general architecture of their skulls, their massive unbroken brow-ridges, or their heavy jaws, chinless and set with robust though definitely hominid teeth. Yet in their upright posture, their right-handedness and their capacity for speech they show themselves apt for culture, an aptness for which in the case of *Sinanthropus* we have direct archaeological evidence. Geographically they are distributed widely over the territories occupied by the earliest men (Fig. 6),

¹ 12, 54-62.

while chronologically those which can be securely dated belong to the Early or Middle Pleistocene. Together they constitute at once the earliest and morphologically the most archaic group of fossil hominids known to science.

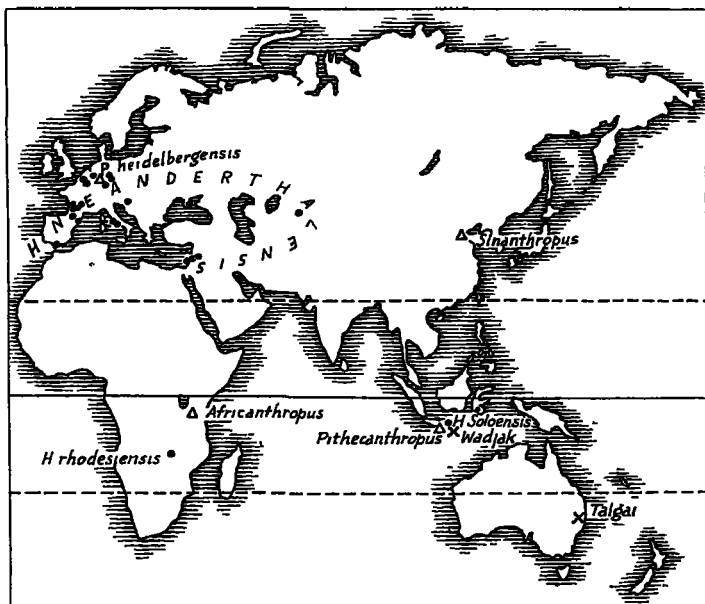


Fig. 6. The distribution of early hominid fossils.

△ ANTHROPIANS

● HOMINIANS

(2) The hominian type, about which most is known, is *Homo neanderthalensis*, so called from the discovery made in a cave in the Neander gorge near Dusseldorf in 1856. The existence of Neanderthal man has since been established over extensive territories (Fig. 8) from Gibraltar to Palestine and beyond the Caspian, and it has become evident that he existed in several distinct varieties, not all of which flourished at the same time. The major groups already include:

(i) A western European group, found in France (La

Chapelle-aux-Saints, La Ferrassie), Belgium (Spy) and Iberia (Gibraltar), and dating from the first maximum of the last glaciation (Würm I).

- (ii) A central European group, occurring in Germany (Ehringsdorf), Italy (Saccopastore) and Yugo-slavia (Krapina), and dating from the last major interglacial period (Riss/Würm).
- (iii) A group earlier than either, comprising two fragmentary finds: (a) a skull from Steinheim, Wurtemberg, found in 1933. (b) the occipital and left parietal bones of a thick skull found in 1935-6 at Swanscombe, Kent. Absence of the frontal portions of the skull make accurate diagnosis impossible, but the bones agree closely with the analogous ones of the Steinheim skull.

The Steinheim skull dates from the Mindel/Riss or from the Riss/Würm interglacial, and the Swanscombe fragments date from the Mindel/Riss.

- (iv) An Asiatic group, represented by a dozen or more individuals from the caves of Mount Carmel, Palestine (10 from es-Skhül, and 2 or more from et-Tabūn), and by single ones from a cave near the Sea of Galilee, from Kiik Koba, Crimea, from the rock-shelter of Teshik-Tash, near Tashkent, and from a cave in the Gissar Mountains of Siberia, the last two being the remains of children.

In general, the most extreme type, in the sense of distinctness from *Homo sapiens*, was the western European, represented most completely by the man from La Chapelle-aux-Saints. Among the most marked features were the low-vaulted skull, the brain, which though sometimes well above the modern average in volume, was simpler in its convolutions; the massive and continuous brow-ridges; the large teeth with their capacious root-cavities; the face, large

and prognathic (Fig. 5c); the lack of a canine fossa; and the carriage, still not fully erect (Fig. 7). The appearance of the man from La Chapelle-aux-Saints may best be conveyed by Elliot Smith's description.

'His short, thick-set, and coarsely built body was carried in a half-stooping slouch upon short, powerful half-flexed legs of peculiarly ungraceful form. His thick neck sloped

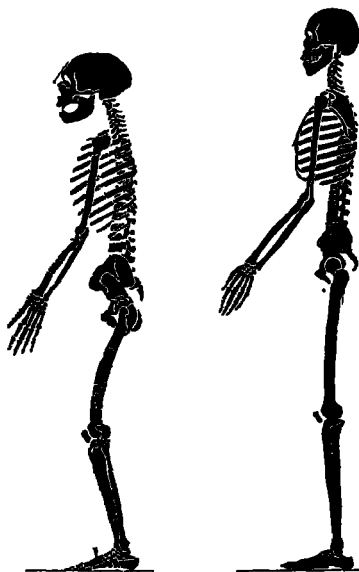


Fig. 7. Skeletons of *Homo sapiens* (modern Australian) and *Homo neanderthalensis* (La Chapelle-aux-Saints) compared. Note the difference in bearing and carriage, especially marked in the curvature of the spine and the posture of the head. (After Boule.)

forward from the broad shoulders to support the massive flattened head, which protruded forwards so as to form an unbroken curve of neck and back, in place of the alternation of curves which is one of the graces of the truly erect *Homo sapiens*. The heavy overhanging eyebrow-ridges, and retreating forehead, the great coarse face with its large eye-sockets, broad nose and receding chin, combined to complete the picture of unattractiveness, which it is more

probable than not was still further emphasized by a shaggy covering of hair over most of the body. The arms were relatively short, and the exceptionally large hands lacked the delicacy and the nicely balanced co-operation of thumb and fingers which is regarded as one of the most distinctive of human characteristics'.¹

Although the other three groups share the characteristics of the first, they appear to exhibit them in less pronounced form and to stand closer to *Homo sapiens*; this applies particularly to the earliest fossils, those from Steinheim and Swanscombe. The fact that Neanderthal fossils diverge further from *Homo sapiens* the closer they stand to him in point of time, argues for the view that the western European variety stood further off the main line of evolution than those of the rest of Europe and Palestine.

Further afield there remain two other hominian forms to be described. Of these, *Homo rhodesiensis* is represented by a single skull, lacking the lower jaw, found in the Broken Hill mine in 1921, under conditions which leave unsolved the problem of its geological age. The skull has unbroken brow-ridges, prodigious proportions and a large flat face and palate, and lacks the canine fossa characteristic of *Homo sapiens*. Although in some respects more archaic in appearance than Neanderthal man, in others *Homo rhodesiensis* is more modern. The other, *Homo soloensis*, is better documented, although full details of the discoveries at Ngandong on the banks of the Solo river in Central Java are still lacking. Of the eleven skulls recovered, six were more or less complete, four lacked the occipital bone and one was that of a child. As a group they are remarkably homogeneous. In their continuous, well-developed brow-ridges and in the absence of a well-filled forehead, they resemble Neanderthal man, but their brains were smaller in size as well as more primitive in their convolutions, and the pronounced flatness of the forehead common to

all the adult skulls, may well be a racial feature. The Ngandong skulls came from deposits of early Upper Pleistocene age.

The new discoveries show that the hominians extended, like the anthropians before them, from western Europe to the Far East, with a downward extension into Africa. Although retaining such archaic features as continuous brow-ridges, an ill-developed forehead, jaws with at best only incipient chins, and an incompletely erect posture, the hominians almost qualify as men if only because of the capacity of their brains.

(3) The most significant division in the hominid series is that between *Homo sapiens* and all other types, since the whole possibility of the higher evolution of culture depended upon the emergence of modern man as an organism with potentialities almost limitlessly superior. When we come to compare their respective achievements in the realm of culture, we shall find a gap in quality of mind between them as impressive as the more palpable differences in morphology. From a purely physical point of view *Homo sapiens* must have presented a strange contrast, when late in the Pleistocene he began to spread into Europe. Fully erect, his finely chiselled head poised on a well-balanced vertebral column, he differed from the average European of the present day only in the slightly larger size of his brain. When we meet him associated with upper palæolithic cultures in Europe, he was apparently differentiated into several distinct varieties. The problem of his origins and descent remains unsolved.

Elliot Smith and Keith have taught us to visualize *Homo sapiens* emerging at the head of a primitive hominid stem, from which specialized forms such as *Pithecanthropus*, *Sinanthropus* and *Homo neanderthalensis*, have branched off to become, in due course, extinct. According to this conception we have a central trunk, throwing off numerous side

branches, but itself sending down roots to the very soil from which the whole tree has sprung. More recently Zuckerman sought to express zoologically the two-fold division of the hominids to which Elliot Smith had been led partly on cultural grounds, by suggesting the division of the family *Hominidae* into Palæoanthropic and Neoanthropic groups. In conformity with this conception, Leakey evolved a family tree, of the same general character as Keith's and Elliot Smith's, but having two main stems, bifurcating far back in the Tertiary period. Of these, the palæoanthropic stem and its side branches, accommodating all the forms with prominent and continuous brow-ridges, he regards as extinct, the whole development of humanity resting with the parallel neoanthropic stem. It is of the essence of both variants of the classical conception of human descent that one should expect to find fossils of *Homo sapiens* or his immediate prototypes at an early stage in hominid evolution. This was clearly perceived by Leakey, who rightly emphasized that, so far from being unexpected, the antiquity of *Homo sapiens* was logically involved in the conception of human phylogeny then current.¹ For this reason his claim to have discovered neoanthropic fossils at Kanam and Kanjera, Kenya, in deposits respectively of Lower and Middle Pleistocene age aroused exceptional interest. Unfortunately his discoveries have not been substantiated,² and the fossils of Kanam and Kanjera, like those found by Prof. Reck at Oldoway,³ Tanganyika, must for the present be ruled out of any serious discussion of Lower or Middle Pleistocene man.

Rejection of the Kenya claims, while it in no way invalidates the thesis sustained by Elliot Smith and Keith, does focus attention on the rarity of fossil evidence that may justly be claimed to stand on or close to the hypothetical direct line of human evolution. This indeed narrows down to the fossils recovered from a shallow seam of gravel at Piltdown,

¹ 19, 202-3. ² *Nature*, 9 March 1935, p. 71. ³ 19, 204.

Sussex, on the basis of which Smith Woodward created the genus *Eoanthropus dawsoni* in 1913. If the skull is, really of the same age as the gravel in which it was found by a gravel digger close to the surface—and in support of this we must rely on the subsequent recovery of fragments by Smith Woodward under conditions which satisfied him that the skull was not a later insertion—then it would appear from associated animal remains to belong to an early stage of the Pleistocene. Its extreme thickness is a feature of early skulls generally, but morphologically, the brain-case lacks some of the more obviously simian or palæoanthropic characteristics, such as excessively well-developed brow-ridges. Unfortunately the Piltdown skull was broken before coming to scientific knowledge and the incomplete fragments have been set up to give widely varying versions of the original form, as the following table setting out the cranial capacity calculated by leading authorities well shows:

Smith Woodward (original)	..	..	1070 c.c.
Elliot Smith	..	..	1200 c.c.
Smith Woodward (revised)	..	..	1300 c.c.
Keith	..	..	1400 c.c.

From this it is hardly surprising that, whereas Keith maintained that the cranium 'in its general conformation does not differ materially from human skulls of modern type',¹ Elliot Smith² was able to refer to it as 'ape-like in its architecture', containing a brain 'not only small, but also singularly defective in those parts upon which the display of man's distinctive qualities depend'. Equally there is dispute as to whether the lower jaw, recovered later from the same spot, does or does not relate to the cranium: if in common with most British anthropologists, we accept them as belonging to the same individual, we have to face the fact that *Eoanthropus* had a jaw so simian in character that many

¹ 7, 602. ² 11, 25-27.

have refused to credit it as human, while possessing a cranium in some respects closer to *Homo sapiens* than to Neanderthal man.

What may be termed the classical conception of human descent has recently been fiercely challenged. Franz Weidenreich has characterized the 'zeal to seek for specializations and to proclaim such "specialized" types as "discontinued" side branches of the human evolution' as 'the greatest obstacle in correctly understanding those relations'.¹ Not only does he support the view, already advanced by Hrdlička, that Neanderthal man marked a stage in the evolution of European man, but he also urges that *Sinanthropus*, *Pithecanthropus* and *Homo rhodesiensis*, were ancestral respectively to the Mongoloid, Australoid and perhaps the Negroid stocks, each with a general tendency to develop in the direction of their modern representatives. Only so, he argues, can we account for the localization of the major racial divisions of man and the existence of distinct types in different parts of the ancient world as far back as Middle Pleistocene times.

Hans Weinert, while sharing Weidenreich's main thesis that the old palæoanthropic stocks have contributed to the living races, has recently offered a more balanced synthesis. In contradistinction to Keith and Elliot Smith, he stresses the horizontal rather than the vertical aspects of human evolution and invites us to think of a broad flight of steps rather than of a tree with an intricate pattern of side branches. Up these steps, he suggests, the prototypes of man ascended from the anthropian level of the Lower and Middle Pleistocene to the hominian stage of the early Upper Pleistocene and so to that of *Homo sapiens*. It is a striking fact that, despite the paucity of the fossil material, both the earlier stages are distributed widely over the zone occupied by the earliest men (Fig. 6) and that between them there are already many well-defined links. Heidelberg

¹ 22, 69.

man is an obvious precursor of Neanderthal man and the Java ape-man of the men of Ngandong, while some of the skulls from Chou-kou-Tien point in a similar direction, in a few cases standing nearer to the hominian group than to *Pithecanthropus*. While admitting that the Neanderthals of western Europe stand off the main line of development, Weinert insists that this does not of itself entitle us to expunge the Old World spread of palæoanthropic man as a whole from the book of life. On the contrary, he regards palæoanthropic man as a stage in the evolution of modern humanity. Following Weidenreich and previous writers, Weinert traces the Australoids back to *Pithecanthropus*, by way first of such proto-Australoid skulls as those from Wadjak (Java) and Talgai (Queensland), and next of the hominian *Homo soloensis*. *Homo sapiens* of the European variety he regards, in common with Keith and McCown,¹ as having emerged from a Neanderthaloid stock somewhere in western Asia, the closest fossil representatives of which are those from the cave of es-Skhul, Mount Carmel. As to the great Negroid and Mongoloid branches of humanity, Weinert regards these, not as derived from distinct hominian stocks, but as divergent and specialized races of *Homo sapiens*. There is evidence to suggest that already in Upper Palæolithic times the Negroid peoples were at least in some measure specialized.

Before reviewing the successive steps by which the hominids improved their conditions of life, it is worth pausing to reflect that, although from a cultural viewpoint external nature was inert and only man creative, yet the vicissitudes of nature were not without their effect in modulating human opportunity. The Pleistocene period was one of great changes, primarily climatic in character, but operating also through flora, fauna and the interrelations

¹ 16, 16. Sir Arthur Keith has here modified his earlier views to accord with the new evidence. There are signs that we may be approaching a new synthesis.

of land and sea. In the present temperate zones, and at sufficiently high altitudes even at the equator, the most prominent symptoms were phases of glaciation interrupted by interglacial stages. For example, at the height of the Ice



Fig. 8. Europe at the peak of the Würm glaciation. (After Blanc.)

Key to finds of fossil hominids:

- | | | | |
|---------------------------|-----------------|------------------|------------------|
| 1. Gibraltar | 6. Le Moustier | 11. Steinheim | 16. Monte Circeo |
| 2. Bañolas | 7. La Quina | 12. Ehringsdorf | 17. Kuka Koba |
| 3. Malarnaud | 8. Spy | 13. Taubach | 18. et-Tabūn |
| 4. La Chapelle-aux-Saints | 9. La Naulette | 14. Krapina | 19. es-Skeḥūl |
| 5. La Ferrassie | 10. Neanderthal | 15. Saccopastore | 20. Galilee |

a. Piltdown b. Swanscombe c. Heidelberg

Age the glaciers of Scandinavia had coalesced and ultimately spread over the whole of Northern Europe, covering the greater part of the British Isles and Holland, Germany north of the Harz and Sudeten mountains, almost all of Poland and a substantial part of north-western Russia (Fig. 8) to a depth of many hundreds of feet at the core of

the ice-sheet. When the sequence and relative intensity of the different glacial stages have been determined for any region, they form convenient divisions of Pleistocene time, as shown in the following table based on Penck's

Recent	Post-glacial	
Upper Pleistocene	Würm	or 4th glacial
	Riss/Würm	or 3rd interglacial
Middle Pleistocene	Riss	or 3rd glacial
	Mindel/Riss	or 2nd interglacial
	Mindel	or 2nd glacial
Lower Pleistocene	Gunz/Mindel	or 1st interglacial
	Gunz	or 1st glacial

researches on the phases of the Alpine ice-sheet. In so far as geologists are able to equate phases in the development of other ice-sheets with those discovered by Penck, they make it possible to apply his terminology to areas far beyond the Alps. The glacial stages of Penck and others are now seen to have been only the most pronounced of a highly complex series of oscillations, but for present purposes they will suffice. In regions nearer the equator fluctuations took the form of periods of greater (pluvial) or less (interpluvial) rainfall. Precisely how glacial and pluvial phases should be correlated in time is still the subject of research in many parts of the world.

As with climate, so with vegetation and animals, we find a series of major fluctuations. In temperate zones forests invaded or evacuated the open tundra round the margins of the ice-sheets in order of their tolerance to cold, while nearer the tropics it was the desert margin which moved backwards and forwards as wet periods alternated with dry. As zones of vegetation swung back and forth so the animals dependent upon plant food shifted in sympathy.

Widespread geographical changes were also involved. Land-masses sank isostatically under the weight of ice-sheets and rose again as they melted, while sea-levels fell and recovered again eustatically as vast quantities of water were alternately locked up in waxing ice-sheets or released from waning ones. In the Mediterranean, which was sufficiently remote from the centre of a major ice-sheet to be free of isostatic land-movement, the eustatic factor was predominant, glacial phases being marked by low and interglacial by high sea-levels. A point to note is that even at the peak of a major glaciation there was no land-bridge connecting Europe with Africa, whereas between Europe and Asia there was a broad highway, offering every facility to human migration.

While the manifold changes of Pleistocene times must have affected profoundly the course of early migration, there is no evidence that it influenced particularly the evolution of culture until man had reached a stage when intellectually and socially he was fitted to pass from savagery to barbarism. It is immensely significant that, whereas vast and oft-repeated cycles of natural change had unfolded themselves without eliciting any perceptible response in the dull brains of the anthropians or the hominians, the first major climatic fluctuation since neoanthropic man appeared on the scene precipitated one of the decisive changes in human history. The evidence suggests that the desiccation of much of north Africa and western Asia, consequent on the northward shift of the temperate zone of the northern hemisphere at the close of the Pleistocene, may have stimulated food-gathering and hunting groups in these regions to domesticate animals and plants instead of themselves migrating, the momentous step which marked the transition from savagery to barbarism.

CHAPTER II

THE LOWER SAVAGERY

THE natural history of man, his evolution as an organism, culminating in the emergence of *Homo sapiens* with all the faculties of modern man, is but a prelude to his cultural history, his age-long struggle to better by artificial means the conditions under which he lives. Whereas the success of all the other animals is gauged by their capacity to conform instinctively to the immediate requirements of their natural environment, man alone has striven, by taking thought, to bend external nature to his will and wrest from her what he needs to live fully according to his own standards. It is the sum total of the technical, social and conceptual apparatus evolved in this process, that we term culture and it is according to the degree to which it involves control over nature that we grade any manifestation of culture. 'The human struggle for existence expresses itself in a never-ending attempt to make of culture a more effective instrument with which to provide security of life and survival of the species.'

It would be false to infer from this that early man set out deliberately to perfect his culture, any more than an animal aims to improve its organism. Scientific research, involving a conscious quest into the unknown in pursuit of abstract truth about the material universe, is a function of civilization confined even there to a minute fraction of the population. The origins of many of the fundamental discoveries, such as farming or metallurgy, seem in fact to have derived from caprice or from religious or æsthetic considerations rather than from utilitarian endeavour. But one should not forget the equally well-established fact that potentially useful discoveries spread rapidly to areas where men are free to apply them to the purposes of daily life without reference to any inhibitions that might have

restricted their use in their places of origin. A cow may remain a sacred animal in one place, but elsewhere be put to all of a variety of uses; again, gunpowder remained a plaything among the Chinese, only to become in Europe an agent of immense social change through its application to war. If it would be to take too rosy a view of human nature to claim that new inventions were invariably seized upon 'to make life more secure, more comfortable, pleasant and permanent',¹ at least it can be claimed that, whatever their original motive, discoveries have as a rule been appropriated by mankind in such a way as to increase his ability to control natural forces. In this sense it is true that the driving power behind the evolution of culture is nothing else than the biological urge to live as fully and securely as possible.

The primeval condition of man—his only condition for the first ninety-nine per cent or so of his history—was that of savagery, under which he had to depend for subsistence on such wild animals and plants as were yielded by his incessant quest for food. An excellent idea of life under savage conditions can be had from studying the features common to such modern savages as the Bushmen, the Vedda, the Andamanese and the recently extinct Tasmanians. It must, however, be recognized that the savage peoples of today live in restrictive habitats into which in certain cases they have only recently been driven; that in some instances the culture of savages has been modified by contact with that of groups at a more advanced stage of development; and further, that in no case can existing peoples be treated as truly primitive, each group having been subject to more or less divergent development over very lengthy periods of time. Yet, features common to recent groups of savages in widely separated parts of the world are likely to reflect broadly those obtaining among the savages of primeval antiquity.

The basic characteristic of savagery is dependence on wild sources of food-supply with all the disadvantages that this implies. The idea that savages enjoy some advantage over civilized man through consuming only 'natural foods' is very far from the truth, when in fact we find among them an 'extremely wide prevalence of malnutrition, deficiency diseases, and a general lack of resistance to infection',¹ not to mention a low average output of energy. The ever-present fear of starvation causes the bulk of economic effort to be turned directly to the quest for food, the chief occupation of every active member of the community. This pre-occupation with the basis of subsistence, combined with a low average of vitality, is of itself sufficient to set narrow limits to the possibilities of cultural achievement under a state of savagery.

No less restrictive are the various indirect consequences of this dependent, parasitic mode of life. In localities where supplies of shell-fish are plentiful all the year round, savages may, like the aborigines of Tierra del Fuego, settle down by the sea-shore and eke out a fixed though wretched existence as strand-loopers, but as a rule the seasonal changes in his sources of food cause the savage to lead a semi-nomadic life. If it is wrong to imagine that his wanderings are aimless, when in fact he moves from season to season along well-worn grooves, collecting the various fruits of the earth in order of their appearance and following in the wake of migrating animals, it remains true that to sustain life the savage has usually to keep on the move. His dwellings will be seasonal rather than permanent and his possessions limited to what he can carry. ✓

Again, to sustain life by hunting and collecting, a vastly larger area is required for each individual than under any more advanced form of economy. Moreover, population under such conditions is not only sparse, spread thinly over immense territories, but the size of individual social

¹ 35 B, 1.

units is strictly limited. As a rule the largest social group is that of the family, generally not more than from fifteen to twenty individuals. Only at certain periods of the year, when food is temporarily plentiful, will a number of family groups drawn from an extensive territory meet together to perform ceremonies, and to glory amidst plenty in unaccustomed feelings of solidarity. The savage is denied, except on rare occasions, the stimulus which only fresh contacts can bring: his stock of ideas is desperately limited and his chances for exchanging them even more restricted. Further, in a community as small as that normal under savagery, there is little scope for sub-division of labour other than that between the sexes, and without specialization there is slight opportunity for technical development.

It is no wonder that savage societies stand everywhere at a low level of technology. The social basis for anything so complicated as metallurgy is lacking. So far as possible natural materials are utilized in their natural state. Gourds and shells, or perhaps baskets, take the place of fired pottery as receptacles, and skins, bark or wild grasses, rather than textiles, serve as garments. Private property is limited to such things as weapons, digging sticks, collecting bags and personal trinkets, although in dividing meat, for example, the share of each individual is as a rule socially defined. Communal rights are generally recognized to extend over all the territories required to provide food for the group, territories within which the seasonal wanderings are confined and the limits of which are known to neighbouring groups.

The low cultural status of savage societies can best be illustrated by considering the amount of energy at their disposal. Lacking the aid of domestic animals, the controlled increment of crops, and the enhancement of his own strength by any but the simplest of mechanical contrivances, the savage has little to depend upon but his own strength and that of his combined fellows. Taking one man-power

as the equivalent of one-tenth of one horse-power and making due allowance for infants, the aged and the sick, we arrive at one horse-power as a fair measure of the maximum energy of the largest social groups normally encountered under conditions of savagery. In modern terms the total output of energy in savage Europe at any one time probably never exceeded that of a single four-engined bomber. It has to be remembered also that not even this meagre supply was adequately applied among men subject to a greater or less degree of malnutrition and incapable of long sustained labour.

Psychologically the savage is a true child of nature. Like a child he fails to discriminate between 'the inner life of the soul and the external environment' and feels himself at one with nature, animate and even inanimate. Evidence for this is to be found in the innumerable stories which savages delight to tell, stories in which all manner of natural phenomena are endowed with personality and act as human beings. Indeed, to the savage, as to the child, 'the objects of the environment exist only in so far as they have a vital significance, an influential quality, for the living organism'.¹ Consequently the savage feels confident of his ability to influence external nature by an intensive act of will through the operation of magical practices. If reliance upon magic rather than upon science has acted as a drag on the evolution of culture, it had the great social merit of maintaining solidarity and fortifying self-confidence among peoples often ill provided with cultural equipment.

Until he emerged from a state of savagery the possibilities of man's cultural development remained narrowly circumscribed and progress was inevitably at an extremely low rate. This applies with special force to the earliest periods when man and his immediate forebears were taking their first tentative steps as cultural beings, since not only is the rate of progress slowest where the stock of ideas is most

exiguous, but, prior to the emergence of *Homo sapiens* in evolved form, the hominids were limited by biological handicaps. It is this which renders so vitally important the distinction drawn by Elliot Smith between Palæoanthropic and Neoanthropic man in the sense in which he used the term; whereas the former was restricted to a low form of savagery, the latter was capable, not only of exploiting to the full the possibilities of savagery in its highest form, but ultimately of breaking free and achieving the status, first of barbarism and ultimately of civilization.

Prehistoric archæologists have had to concentrate on the stone artifacts of the earliest savages for lack of evidence bearing more directly on their habits and mode of life. But implements and the methods used to make them are more than mere fossils, useful for zoning cultures in the geological sequence or distinguishing individual communities; they are themselves eloquent memorials of human achievement, reflecting in their evolution that progress in discrimination and dexterity which, we have seen, played so important a part in the development of mind. The tool, interposed between the organism and the achievement of its aim, is a very symbol of that purposeful activity, that repeated exercise of will, which we recognize as the hallmark of man. Thus, the mineral terminology of the prehistoric archæologist is rather more than a mere confession of ignorance and we may with confidence equate the cultures dominant in the lower and middle stages of the Palæolithic or Old Stone Age, as defined by prehistorians, with the stage of Lower Savagery.

The beginnings of tool-making are still wrapped in obscurity. By analogy with the great apes, it is likely that sticks, at first in their natural state, but later artificially shaped, were among the first objects appropriated by the early hominids to supplement their limbs in the struggle with external nature. The chances that such would survive are slight and up to the present all we have to show of the

wooden equipment of Lower Palæolithic man is the artificially pointed stake from a deposit at Clacton-on-Sea, Essex, which yielded fossils of *Elephas antiquus*. From the moment he began to hunt, however, he must have been brought into contact with other materials of great utility. As he stripped the flesh from the carcasses of his victims the early hunter exposed the skeleton and as he broke the bones to extract the marrow he must have learnt something of their qualities. Again, his observation of the uses to which wild animals put their teeth, tusks and horns must have suggested ways in which they might subserve his own purposes. Yet without tools sufficiently tough to cut and shape these animal materials, it is difficult to see how they could have been utilized to much effect. It is notable that the elephant bone from the Piltdown gravel, found close to the skull of *Eoanthropus*, must, if really a tool, have been shaped by flint or stone and that the technique said to have been employed in pointing one end of the great thigh-bone is one proper to wood. Although there is evidence that *Sinanthropus* utilized bone and antler, the effective use of these materials for the fabrication of recognizable tools, weapons and objects of adornment did not become general until the stage of Higher Savagery.

Among the various kinds of easily flaked stone, there was available in most regions a material capable of being converted into tools and doubly useful for shaping organic substances. The most tractable, and to the prehistoric most revealing substances, were flint, obsidian and chert, but various kinds of quartzite were capable of being flaked to a reasonable working edge, and, where the most easily worked stones were absent, recourse could be had, as at Chou-kou-Tien, to vein quartz, green sandstone and even limestone. At first, no doubt, stone was utilized rather than worked, convenient pieces fractured in the course of nature being selected for the task in hand and discarded after use. Moreover, the earliest artificial shaping of stone tools prior

to use must have been so elementary as to be in many cases hard to distinguish from the handiwork of nature. The ability of such agencies as the sea, or strata settling on a yielding foundation, to flake flint is sufficient to render entirely problematical the task of distinguishing the handiwork of the early hominids, if reliance is placed on selected specimens alone; a valid decision can only be reached by taking account of the circumstances under which they are found. The crudely fractured pieces of stone from Chou-kou-Tien would never, in the vast majority of instances, have been recognized as showing traces of artificial work had they been recovered isolated in a geological deposit.

The wonderful discoveries made in the quarries at Chou-kou-Tien have indeed given us our only clear insight into the cultural status of the anthropians. From deposits, which in places attain a thickness of as much as 50 metres, Mr. Pei Wen Chung and his distinguished collaborators have recovered, in addition to quantities of stone implements crudely fashioned from intractable materials, much precious evidence about the life habits of *Sinanthropus*. This we owe primarily to the fact that during the cold season Pekin man dwelt in caves, the subsequent collapse of which further contributed to the preservation of their contents. The predominating impression we receive is that *Sinanthropus* was a great hunter. His favourite meat was venison, of which he hunted two varieties, *Euryceros pachyosteus* and *Pseudaxis grayi*. The absence of half-grown antlers shows that during the summer months *Sinanthropus* must either have changed his menu, or, what is much more likely, have left his cave and pursued his food quest on the move in response to seasonal change. Again, the fact that nearly all the antlers of *Pseudaxis* had been broken from the skull, whereas almost all those of *Euryceros* had been collected loose, having been shed after the rutting season at the beginning of winter, suggests that the former was hunted at the close of summer or during the autumn, the

latter during the winter months. The cave-dwellers of Chou-kou-Tien by no means confined themselves to deer. Bison, beasts of the musk-ox family, gazelle, horse, wild boar, leopard, tiger, hyaena, bear, rhinoceros, and elephant, all fell victims to this early hominid hunter. The absence of anything that might be construed as a missile weapon suggests that traps must have played a large part in securing the quarry. While there is no sign that *Sinanthropus* made elaborate tools from the bones, antlers, and horns yielded by his rich hunting bag, there is plenty of evidence that he utilized them in a variety of ways, breaking them in such a manner as to be easily handled. The meat he probably roasted over an open fire, evidence for which in the shape of bands of carbonaceous ash, associated with yellow and reddish discolourations of the cave floor, together with signs of burning on bones and antlers, was widespread. Fire, the discovery of which probably came with the working or even the utilization of flint or other spark-giving stones, was an immense asset to man, supplying warmth, keeping wild beasts away from his home, enabling him to cook his food, and opening up a long vista of technical progress.

Although traces of upwards of 40 hominids have already been recovered from Chou-kou-Tien, there is no sign that *Sinanthropus* buried his dead. On the other hand there is every indication that he was a cannibal with a special taste for brain. Human bones were scattered haphazard through the deposit in just the same way as those of the bones of the other animals eaten for food. Some of the skulls show signs of heavy blows with more or less pointed implements, and in every one of those with almost complete brain-case there is evidence that these had been 'opened from the side of the base, probably for the purpose of reaching their contents, namely the brains'. Fragments of thigh-bones suggest that these had been split for their marrow in the same manner as those of other food animals. So conclusive

is the evidence that *Sinanthropus* was eaten, that some anthropologists have argued that he was himself hunted by men as yet undiscovered. By such an argument it is possible to escape from any distasteful conclusion; what is certain is that from upwards of 8,000 cubic metres of deposit, rich in fossils, not so much as a single tooth of these creatures of the imagination has come to light.

The stone industry from the *Sinanthropus* levels at Choukou-Tien is difficult to classify in terms of others of similar age in parts of Europe, Africa and Asia, where more easily worked materials were available. The commonest tools were crude choppers formed by striking a few flakes from a pebble or small boulder, but naturally fractured pebbles and a few flakes struck artificially from parent nodules were also utilized. Closest analogies lie with the stone industries found in the valley of the Soan river in the Punjab, the earliest of which belong to the same period.

The stone industries of the Middle Pleistocene fall for the most part into two main groups, those in which the leading part is played by 'hand-axes' fashioned by reducing a nodule, or occasionally a thick flake, to the desired shape, and those in which a flake, struck from a parent nodule or core, itself formed the basis of the implement. The hand-axe industries, in which the finished implement consisted of the residual core of the parent nodule, almost certainly originated in the tropics, where they occur abundantly in East Africa, the Congo, French Sudan, the Rhodesias and southern India. Elsewhere they are found in the existing sub-tropical belts of the Union of South Africa, the Punjab, Egypt, Sinai, Palestine and Syria, Libya, Tunisia and Morocco, as well as from interglacial deposits in southern and central Italy, Iberia, France, Belgium and England as far north as East Anglia and the Midlands. The vast spread of Asia north of the Elburz-Himalaya mountain axis, and the plain of Europe, north of the Alps and east of the Rhine was, so far as it was settled at all prior to the Upper

Pleistocene, inhabited almost exclusively by people who depended on flake industries. To complete the picture, the flake tradition interpenetrated almost every part of the vast province of the hand-axe industries, resulting during Upper Pleistocene times in much crossing and hybridization. In origin it seems likely that the two main industrial traditions must have related to fundamental differences in the conditions of life. It is significant that hand-axe industries are confined to regions where vegetation was comparatively luxuriant, and it is no less evident that hand-axes, whether held in the hand or mounted on a handle, were better adapted to working wood or grubbing up roots than the frailer flake tools.

During their immensely long history, bridging the Lower, Middle and Upper Pleistocene, each of the main industrial traditions evolved slowly but surely towards greater refinement of form and perfection of functional efficiency (Fig. 9). So slowly did the evolution of culture proceed in those far-off times that, between the crude hand-axes of the earliest stage at Abbeville, and the latest at St. Acheul, the two type stations in the north of France, hundreds of thousands of years have elapsed, by far the greatest part of hominid history. Equally deliberate was the progress of flint-work in the Clactonian and Levalloisian flake traditions. Excessive slowness in the tempo of change was a hall-mark of cultural poverty; conversely, it will become apparent in later chapters how, the richer the cultural pattern, and the more various the possible combination of elements, the greater was the stimulus to change. Who were responsible for the various Lower Palæolithic cultures remains a matter of speculation, though we can say for certain that *Sinanthropus* fabricated the crude pebble tools at Chou-kou-Tien. The only human remains certainly associated with the Acheulian hand-axe culture were the two skull bones from Swanscombe. None have been found with the Lower Palæolithic flake cultures, although

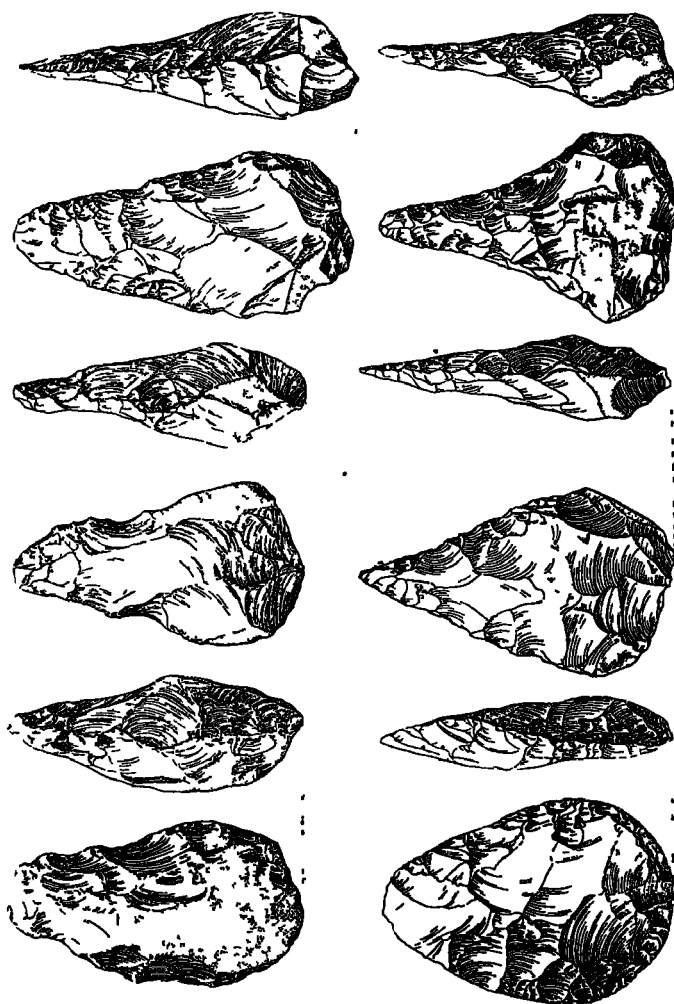


Fig. 9. Evolution (from top left to bottom right) of the Lower Paleolithic 'hand-axe' ($\frac{1}{4}$ to $\frac{3}{4}$). (After Leakey)

it is likely that the individual indicated by the famous Mauer jaw was of this tradition.

Apart from the Pekin finds little is known of the activities of Lower Palæolithic man other than his stone industries, ample evidence for which is forthcoming from the many working places littered with the debris of flint-knapping. One of the few discoveries to tell us much about his way of life in Europe was that made at Torralba, Spain, where, embedded in the shore of an ancient lake more than 3,600 feet above sea-level, were found the stone implements, including hand-axes of early Acheul character, and the discarded meat bones of hunters, who, during the hot summers of an interglacial period, had followed herds of elephants in their annual migrations from the arid wastes of eastern and south-eastern Iberia to the cooler mountain uplands. Such a discovery goes to prove that the hand-axe people, although most of their surviving tools were probably used for working wood or grubbing up plant food, consumed animal flesh with as much gusto as the cave-dwellers of Chou-kou-Tien, when given the opportunity. The hunters of Torralba accounted for rhinoceros, wild ox, stag and horse, as well as elephant.

The prowess of Lower Palæolithic man is the more to be wondered at when we consider the size of his quarry and the puny and apparently ineffective character of his material aids. On the whole it is likely that drop-traps, probably quite small holes sufficient for one leg, were the chief means of securing the larger victims, although it may well be that he sometimes found it easier to rob his fellow carnivores, cave lions, panthers, bears, hyaenas, wolves or lynxes of their prey. It seems unlikely that man was acquainted with traps based on a knowledge of the elasticity of wood, prior to the invention of the bow. Analogy with existing savages also suggests the use of a wooden spear which, hardened in the fire, can be quite formidable; the pointed wooden object from Clacton may well have

been the tip of such a weapon. None of his flint or stone implements are adapted to tip spears, nor, so far as we know, did he work bone or antler into missile heads or indeed into implements or weapons of any kind.

This failure to work bone or antler is only one of many signs of the technological poverty of Lower Palæolithic man, a poverty betrayed in the essential sameness of the stone implement types over vast geographical areas and in the uncanny slowness with which through tens of thousands of years they developed. Even more notable were his æsthetic and conceptual limitations. We have no evidence that he made ornaments for personal adornment or that he practised any form of graphic or plastic art; neither is there any indication that, any more than the higher apes, he discriminated sufficiently between the living and the dead to bury the latter in any formal manner.

Neanderthal man had much the same limitations and his stone and flint work shows few signs of inventiveness. The industries of the Middle Palæolithic owe much to a variety of blendings between earlier traditions of flint and stone working. The specifically Mousterian industry,¹ taking its name from the cave of Le Moustier in the Dordogne, comprises flake tools, of only two leading forms, the side-scraper and the point, having secondary flaking along one or two edges. If his flint work showed little enterprise, Neanderthal man was no more forward in his use of bone or antler. Since he commonly lived in caves, where conditions for the preservation of bone were ideal, the absence of more than a handful of the simplest bone tools from his dwelling places is all the more significant. Though he was fond of using the toe bones of horses and bison as anvils or chopping blocks and though in the

¹ The Mousterian industry proper is generally derived from the Lower Palæolithic Clactonian flake tradition, but the Middle Palæolithic industries of Europe and western Asia, sometimes referred to by the term 'Mousterian', also include mixed flake and hand-axe industries resulting from contacts between Levalloisian and Acheulian traditions.

mountain caves of the Alps he used intentionally broken bones for skinning wild bears and preparing their pelts, there is no evidence that he was in the habit of fashioning implements or weapons from bone or antler, available though materials must have been in profusion.

As a hunter Neanderthal man showed a characteristic lack of versatility. There is no certain evidence that he went in for fishing, although discoveries at the Devil's Tower, Gibraltar, show that he relished shell-fish when these were available, nor is there evidence that he went after wild fowl of any description; further, there is little indication that he hunted small game on any considerable scale, though beaver bones were common at Krapina and Taubach. For big game he must have relied in the main on fall traps, which need not have been large and might well have been made with a simple tool like the wooden digging-stick in the manner of the Bushman. Proof that this method was in fact used is to be found in the predominance of young, inexperienced beasts among the *Elephas antiquus* remains from the Taubach and Mauer sites, as compared with a purely natural assemblage like that at Mossbach:¹

	$\frac{1}{4}$ c years	6-20 years	20-50 years	Over 50 yrs.
Taubach ..	25.5 %	28.8 %	28.8 %	16.7 %
Mauer ..	31.1 %	26.6 %	20.0 %	24.4 %
Mossbach ..	0 %	15.3 %	23.1 %	61.5 %

As to hunting weapons, there is no sign of any advance on Lower Palæolithic man, unless the artificially shaped limestone balls from La Quina (Charente), which range in diameter from 35 to 90 mm., be interpreted as elements of the bolas, a contrivance of two or more balls attached

¹ 73, 84.

to a string, which hurled through the air would rapidly entangle any creature with whom it came into contact.

Aesthetically Neanderthal man appears to have been as unresponsive as his forebears. Although commonly dwelling in the self-same caves and rock-shelters as have yielded such astonishing evidence of the artistic activities of his neoanthropic successors, not a single trace of art can be attributed to him, nor is there any indication that he even went so far in the adornment of his person as to suspend a perforated shell round his neck.

There is abundant evidence to show that cannibalism, involving the eating of the brain, was practised by the hominians, as it had been by *Sinanthropus*. All eleven skulls of Solo man from Ngandong lacked jaws and facial parts and nine had incomplete occipital bones, the base having been broken into to extract the brain, much as the Dayak head-hunters did in modern times. Again, close examination of the Neanderthal skull from the travertine at Ehringsdorf, Germany, similarly defective in the facial and basal regions, has disclosed traces of no less than five wounds, all inflicted when the bone was fresh, one of which on the right of the forehead would alone have been sufficient to cause an immediate loss of consciousness. Cannibalism of a more comprehensive kind is implied by the discovery in a cave at Krapina, northern Yugoslavia, of the bones of more than twenty Neanderthal individuals intermingled with discarded animal remains. The bones, representing people of both sexes and of all ages from infancy to senility, have evidently been broken open for the extraction of brain and marrow; in addition some show traces of fire, and one skull fragment bears definite cuts.

The fact that he was a cannibal with a special taste for human brain did not prevent Neanderthal man from according simple but definitely formal burial to his dead. On the terrace of the Mugharet es-Skhül, Mount Carmel, a real cemetery was found under the overhanging rocks of

the shelter, ten burials in all, ranging from a girl of three and a boy of four to a man of more than fifty years of age. In every case the grave was of the simplest, a shallow hole scraped in the floor without any kind of protection and

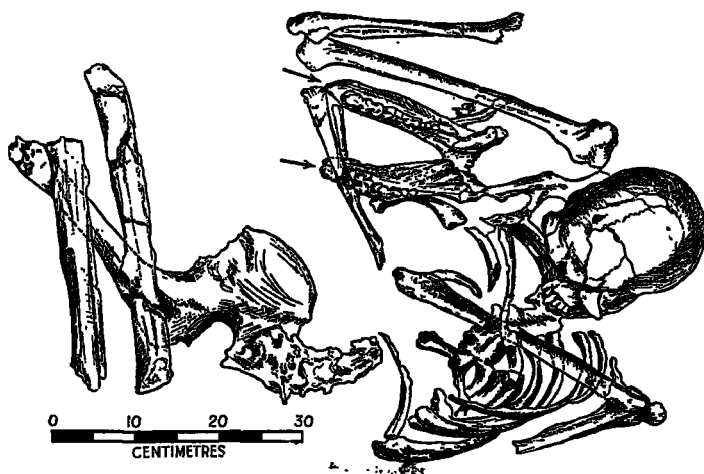


Fig. 10. Neanderthal burial in the *Mugaret es-Skühl*, Mount Carmel.

Note: Arrows mark jaw bones of giant boar. (After Garrod.)

only just large enough to receive the body with arms and legs contracted close; nor was there a trace of ceremonial observance in connection with any one of the burials, unless we except the jaw-bones of a great wild boar apparently clasped in the arm of a man forty-five years of age (Fig. 10)—no grave goods, no colouring matter, nothing but the body bunched together in its simple earth-scooped hollow. Grave goods have certainly been claimed by French excavators of Neanderthal burials; for example the youth from *le Moustier* and the man from *La Chapelle-aux-Saints*, who were buried in an oblong grave sunk in the cave floor, are said to have been accompanied by flint implements and meat-bones. Where skeletons are incorporated in cultural

deposits rich in artifacts, it must remain a matter of opinion whether particular items were in fact deposited intentionally at the time of burial. For my part, I prefer to rely on the results of the only excavations of Neanderthal burials carried out under modern scientific conditions and to deny Neanderthal man more than the formal disposal of the body in a grave. The significance of the tightly flexed attitude in which Neanderthal skeletons are found is debatable. If it was in fact intended to prevent the spirit of the departed from haunting the land of the living, it argues a belief in some form of after-life already at this early stage in the evolution of culture.

CHAPTER III

THE HIGHER SAVAGERY

WITH the Upper Palæolithic we enter a new world peopled by our own species, a world limited by all the restrictions inherent in the state of savagery, yet pregnant with all the possibility of liberation. In the realm of technology we find a new versatility, the use of a wider range of materials, a greater variation in technique, a more rapid evolution and a greater diversity of cultural expression; a more variegated subsistence is won from nature; magic is more potent and æsthetic sensibility is expressed for the first time by art, which in its own sphere challenges comparison with anything since achieved. *Homo sapiens*, exploring for the first time the possibilities of his nature, endowed with senses and powers of perception as acute as those of any living man, is surely a most engaging subject.

So far as we can tell, the territory occupied by neoanthropic man in Upper Palæolithic times was almost entirely

confined to a belt extending from Iberia to north China, defined on the north by the glaciated territories and on the south by the Mediterranean and the mountain axis of central Asia. Recent work suggests that Africa, so far from being the early home of neoanthropic man, was in fact something of a backwater, where cultures of Middle Palæolithic origin continued to develop, throwing off variants like the Aterian and Sebilian of the north and the Still Bay and Bambata of the east and south, inspired, it may be, to a greater or less degree by neoanthropic influences. The earliest African culture of specifically neoanthropic character, the Capsian of Algeria, Tunisia and Kenya, did not appear until near the close of the Pleistocene period.

Although great tracts of Asia remain virtually unexplored, the high significance of the continent in relation to Upper Palæolithic origins is already manifest. In the Far East remains of neoanthropic man come from Late Pleistocene deposits in the upper cave at Chou-kou-Tien, and Upper Palæolithic industries have been traced in the basins of the Shui Tung Kou and the Sjara Osso Gol on the margins of the Ordos desert. Further west, a famous ceremonial burial has been found at Malta, near the southern end of Lake Baikal, while a string of Upper Palæolithic sites has been explored along the upper reaches of the Yenisei. Even richer finds have been made in the lands of south-western Asia bordering the Mediterranean: Palestine and Syria have proved surpassing rich and, in the hinterland, the possibilities of Kurdistan have been proved. Prehistoric investigation has been more intensive in Europe than elsewhere and it is from this westward extension of the Eurasian land-mass that we have learnt most of Upper Palæolithic man. With the details by which the various cultural groups are defined we need not here concern ourselves, but it is important to obtain some notion of their distribution in time and space, if only to serve as a frame of reference for

studying the evolution of culture in its broad outlines. The sequence of Upper Palæolithic cultures revealed by the excavation of cave deposits in France and north Spain is as follows:

Magdalenian
Solutrian
Gravettian
Aurignacian
Chatelperronian¹

The origins and distribution of the Chatelperronian, earliest of the Upper Palæolithic cultures of Europe, are alike obscure. The Aurignacian, on the other hand, found in north Spain, France, Lower Austria, Hungary, Roumania, the Crimea, Transcaucasia, Anatolia and Palestine, almost certainly spread into Europe from a south-easterly direction, ultimately perhaps from the Iranian plateau or beyond, while the Gravettian probably came in from the plain of south Russia, sweeping across central Europe and ultimately extending as far west as north Spain. There is still uncertainty about the origins of the Solutrian culture, which reached from Spain to central Europe as far east as the Pruth and the Dneister, although it has commonly been regarded as a Hungarian growth. In course of time regional development grew more pronounced and the Magdalenian culture, which followed the Solutrian in some areas, was restricted to Spain, France, Germany and Moravia. In other parts of the continent the Gravettian tradition survived, showing itself in a number of local variants, of which the Creswellian of England, the Grimaldian of Italy and the Riviera, and the Mezinian of south Russia may serve as examples. Finally, round the southern fringes

¹In the earlier nomenclature (e.g. 54, 121-123) the Chatelperronian was referred to as 'Early Aurignacian'. The term Aurignacian is used here as the equivalent of the former 'Middle Aurignacian', and Gravettian signifies the former 'Late Aurignacian'. According to the modern conception (68, 4, and 19-23), we have to deal, not with evolutionary stages of the same culture, but with three separate and distinct cultures, each with its own history.

of the dwindling northern ice-sheet, there flourished, in the Hamburgian, a culture combining Magdalenian and Mezinian traits with distinctive features of its own. Such a picture, drastically simplified though it is, illustrates the cultural resource and diversity of neoanthropic man.

Industrially he was far in advance of his predecessors; he worked more materials in a greater variety of ways to produce a wider range of objects. As a rule he converted flint blades into implements and weapon tips by means of steep secondary flaking, but the Solutrians practised shallow pressure flaking of a quality rarely surpassed. More than twenty varieties of burin witness to his capacity for adapting his tools to fine requirements. Stone he was able to shape so as to produce works of art like the friezes at Le Roc (Fig. 17) and Cap Blanc, or small figurines of the type of the Venus of Willendorf, as well as objects of utility, stone lamps, pestles and mortars and the like. In perforating hard stones, such as digging-stick weights or small beads, he worked from both faces, sinking opposed hollows until they intersected. Pottery in the true sense he did not make, but he certainly modelled clay and may even, like the Capsians of Kenya, have used it on occasion to daub the inside of his baskets. Most of his raw materials were of organic, and predominantly animal, origin. In the open tundra or steppe, which he mainly favoured, vegetable materials played a part much less conspicuous than among the tropical and sub-tropical forests which sheltered the hand-axe peoples of Lower Palæolithic times. Wood, vegetable fibres and the like no doubt featured in his economy, but bone, antler, teeth, skins and sinews played a more important role. The first three he worked into a great variety of forms, often applying the technique of polishing from which he abstained in his flint and stone work. Quite apart from his skill in carving, about which we shall have more to say later, the finish he imparted to such commonplace objects as eyed bone needles has rarely been equalled. Skins he used

for clothing, and sinews to string his bows and make lines for his harpoons.

In no way is the superior inventiveness of Upper Palæolithic man more clearly shown than in the variety of his weapons (Fig. 11). The wooden spear of his predecessors

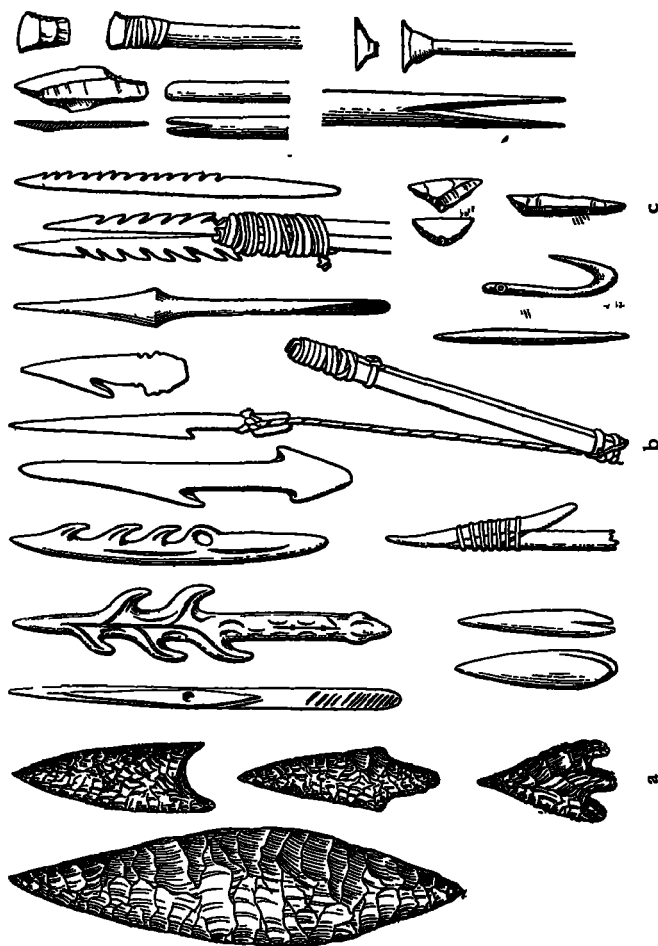


Fig. 11. Hunting and fishing gear of the Higher Savagery. (a) Upper Paleolithic; (b) modern Yaghan; (c) Mesolithic. (After Obermaier, Breuil, Clark.)

he tipped with a variety of flint and bone points and hurled with all the force of a rigid spear-thrower (Fig. 12). More than that, certain Upper Palæolithic tribes knew the use of



Fig. 12. Portion of Upper Palæolithic (Magdalenian) spear-thrower. Note the ibex carved in low relief.

the bow, as witness the flint arrowheads from Solutrian deposits in Spain, barbed and tanged and not to be distinguished from those current many thousands of years later. Marks depicted on bison in the French cave art (Fig. 14, lower right) could be interpreted either as darts or as arrows propelled by bows; the earliest certain representations of the bow are those in the eastern Spanish art, much of which was of Mesolithic date. A famous scene engraved on a piece of antler from Laugerie Basse (Fig. 13) shows a hunter stalking an aurochs with what appears to be a spear in his right hand. To judge from the abundance of spear-throwers and barbed spear-heads from Magdalenian deposits, these people must have hunted the reindeer chiefly by this means. Harpoons, in the sense of barbed heads which became detached from their shaft on striking the victim, while remaining secured to a line, were in common use among the Magdalenians and related tribes. Large fish such as pike and salmon were speared by leisters, formed by two or three barbed prongs of bone mounted at the end of a wooden shaft, and it is likely that pointed bone gorges were also used by the angler. Signs that have been interpreted as throwing sticks are depicted in the cave art and these may well have been used for fowling, as in ancient Egypt.

The evidence of his weapons, supported by the mass of his discarded meat bones and the content of his astonishing art, shows him to have been primarily a hunter. As such, his range was by no means restricted, as were his

predecessors', to big game like mammoth, elephant, reindeer, bison, aurochs, horse and wild pig; in addition he hunted hares, was an expert fowler, bringing down geese, swan



Fig. 13. *Man stalking aurochs, engraved on Magdalenian reindeer antler from Laugerie Basse, France.*

and ptarmigan, and withal a fisherman, catching salmon, trout, pike (Fig. 14, upper left) and a variety of coarse fresh-water fish. Although some of his rock shelters were close to the shore, there is no evidence that he made any serious effort to win food from the sea; the seals, which figure in his art, and the bones of which occasionally appear in the cave deposits, were probably caught in river or estuary, nor need the tunny fish engraved on the wall of Pindal (Fig. 14, top left) betoken more than the artist's reaction to his immediate environment. Versatility in the pursuit of wild life helped to vary and at the same time even out his diet which, no doubt, was supplemented as among the modern Chukche, by vegetable food; what appears to be a digging-stick weight already occurs in the Magdalenian. Wild honey was no doubt keenly sought after, as we are reminded by a painting of the Eastern Spanish group at Las Cuevas de la Araña, Valencia, depicting a man climbing a creeper with a bag or basket in one hand and bees buzzing angrily about his head.

If he widened the range of his victims, the Upper Palæolithic hunter showed a decided tendency, so far as big game was concerned, to specialize on a single variety, seeking by this means to increase his proficiency in the chase. The Gravettians of Moravia and south Russia were evidently keen mammoth hunters. At Vestonice and other

Moravian sites quantities of mammoth bones were found, 'hip bones in one place, tusks in another, molar teeth in a

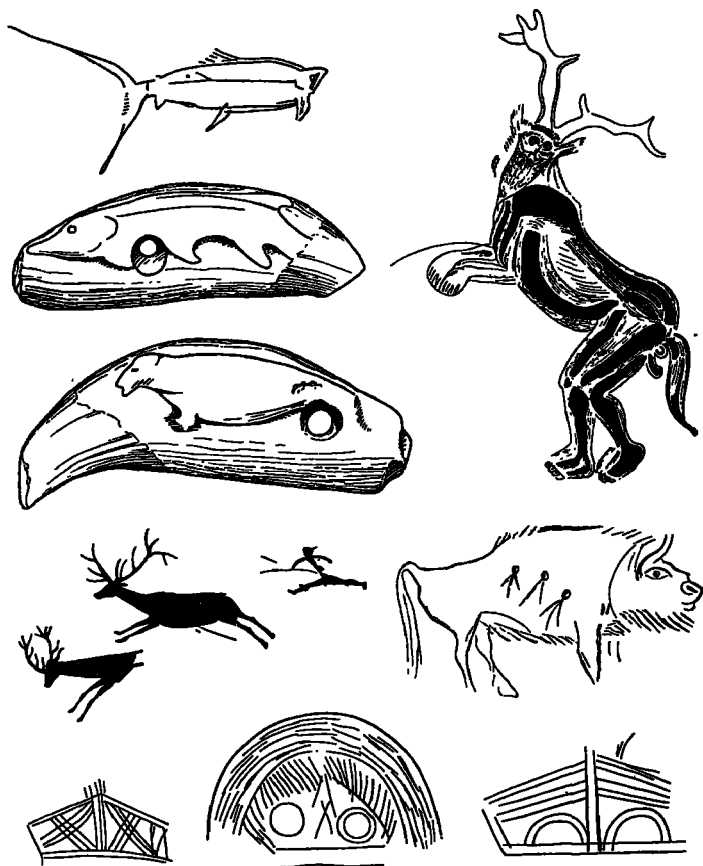


Fig. 14. Upper Palaeolithic (Magdalenian) and Mesolithic (Capsian: left, fourth from top) engravings and paintings from France and Spain.

third, and . . . skulls laid open for the extraction of brains in a fourth'.¹ Similar collections have been unearthed

¹ (8) 371.

at numerous sites in south Russia, at Berdizh in the Gomel region, Gontzi near Poltava and Cyrill Street, Kiev. The great mass of the mammoth bones from the Russian sites were those of young, inexperienced individuals, such as we might expect to have fallen victims to fall-traps.

The Gravettian hunters of La Solutré in south-western France, on the other hand, left a layer of horse-bones one-half to two metres thick over an area of approximately 3,800 metres, representing something like 100,000 individuals. But the favourite quarry of most of the Upper Palæolithic hunters of western Europe was undoubtedly the reindeer, with the bison a good second.

Intensive study of reindeer bones and antlers found on dwelling sites throws a revealing light on the hunters' mode of life. Whereas the material from caves and rock-shelters in the Pyrennees, the Dordogne and the Charente shows them to have been inhabited roughly from November to February, during the time between the shedding of their antlers by adult reindeer and the period when they have grown fresh ones, the reindeer refuse from open sites nearer the margin of the retreating Scandinavian ice-sheet in Schleswig-Holstein shows that these were settled only during the months of summer. All this suggests that Upper Palæolithic man was seasonally nomadic, following his chosen game on their migrations. During the course of a year the normal family group probably moved over a territory hundreds of miles in extent, keeping track of a particular herd and taking advantage of the various plant and insect foods available at different stages of its wanderings.

Nevertheless, he must have passed the bitter winter of the tundra in one dwelling. In limestone areas, where natural caves or rock-shelters abounded, he often made his home in these, living well forward in the cave mouth to catch the mid-day sun and doubtless improvising screens to make himself snug at night and during the colder days.

Where natural shelter was lacking, he built himself houses, sinking the floor below ground-level to lessen draughts and simplify construction as in the earth-houses of the Arctic peoples of today. Winter houses of this kind, made by Upper Palæolithic man, have been found on the banks of the Don and the Desna in the Ukraine and far away in Siberia at Malta. The dwelling excavated at Gagarino near Lipetsk was oval ($4\frac{1}{2}$ by $5\frac{1}{2}$ m.) with a rough kerb of stone slabs and mammoth tusks, no doubt retaining a roof of lean-to construction. More elaborate were the rectangular houses, evidently built on a timber framework, unearthed at Kostenki, south of Voronezh, at Timonovka, near Briansk, and at Malta. A detail noted at many of the Russian sites was the use of mammoth bone as fuel, an effective if malodorous substitute for wood. A clue to the nature of the temporary structures in which he lived during the warmer months is given by engravings on the walls of Font-de-Gaume in the Dordogne, interpreted as showing huts resembling the summer dwellings of the Navaho Indians of north-east Arizona (Fig. 14, bottom).

Store-pits, in which food might be kept over the winter in natural refrigeration, were a feature of the dwellings at Kostenki and Timonovka. How far Upper Palæolithic man dried fish or meat to preserve it for use over an extended period, we can only speculate, but it can be assumed that his opportunities for accumulating surplus wealth were limited. Certain enigmatic marks on bone and antler tools and weapons probably testify to private ownership of personal paraphernalia. Other pieces, cut along the edge with series of nicks and notches, recall tallies used until modern times in the Swiss Alps for counting cattle, pasturage and dairy produce, but presumably in this case intended to record the hunter's score. If we may judge from recent analogies, the sources of food supply were vested in the community and the spoil of the individual hunter was shared according to custom among those who belonged



Plate II. Polychrome painting of reindeer (Mogdalenian) at Font de Gaume, France.

to his immediate group, each receiving a share socially determined and generally recognized.

Neoanthropic man of Upper Palæolithic times certainly lived more securely than his palæoanthropic or sub-human predecessors, but it would be wrong to measure his achievement only in terms of industrial capacity or improved subsistence. The art, which distinguishes his culture from Spain to Siberia, proclaims him a being capable of altogether wider and deeper experiences than any previously known; in it we recognize instinctively the product of a spirit akin to our own, an imaginative perception and a power of expression proper to *Homo sapiens*. The richness and vitality of this earliest body of art is breath-taking; engravings, paintings, reliefs, sculptures and plastic modelling, all testify to such a liberation of the spirit as marks the grand turning-point in hominid history. To beings capable of such a work of art as the horse's head from Mas d'Azil, reproduced on Pl. I, the future lay wide open.

The richest province of Upper Palæolithic art is concentrated in the caves of northern Spain and southern France, with outliers in Germany, Switzerland and Moravia, but the open loess sites of central Europe and Russia have yielded quantities of movable art, and paintings on the walls of open shelters in eastern Spain, many of which are of Mesolithic age, often portray scenes in which human beings figure freely. The earliest art at present known is that associated with the Chatelperronian culture, comprising outlines of animals engraved on cave walls in bold silhouette, like the well-known ones from Pair-non-Pair. The archaeological evidence thus disproves the old theory of Piette that two-dimensional must have had priority over three-dimensional art, on account of the superior degree of abstraction implied by the latter. In any case the argument is false, since the straight-forward visual impression of an object from any given angle is in fact two-dimensional, appreciation of a third dimension arising only through a

synthesis of impressions from diverse angles. The more or less naturalistic figures of women (Fig. 15)—Venuses as they are often flatteringly described—mostly carved from ivory or various kinds of stone, but occasionally modelled, which occur in France, Italy, Germany, Moravia, south Russia and Siberia, can be ascribed to the Gravettians, but

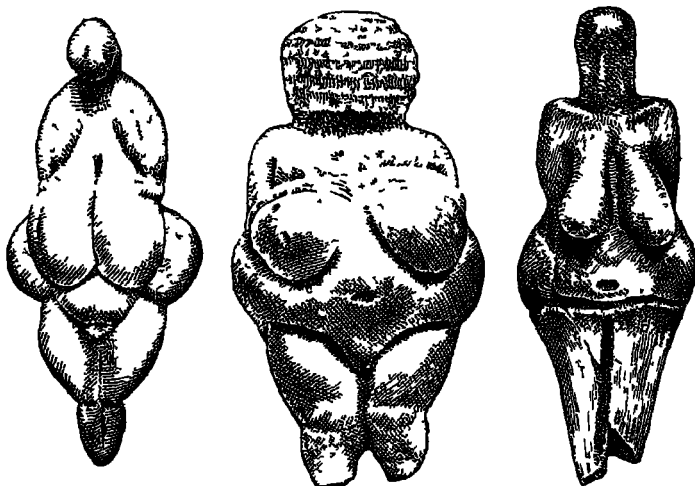


Fig. 15. Upper Palæolithic (Gravettian) female figurines:

- (a) Ivory from Lespugue, France ($5\frac{3}{4}$ inches).
- (b) Limestone from Willendorf, Austria ($4\frac{1}{2}$ inches).
- (c) Fired clay and bone ash from Vestonice, Czechoslovakia ($4\frac{1}{2}$ inches).

others more highly stylized in form were made by the Magdalenians of south Germany and the Mezinians of south Russia. Recent discoveries have confirmed the artistic capabilities of the Solutrians, but the climax of Palæolithic art in western Europe unquestionably came with the Magdalenians, to whom may be attributed the mature polychrome paintings of Altamira and Font de Gaume (pl. II), the sculptured and originally coloured frieze at Cap Blanc and much of the movable art from the caves.

In inspiration, the art was essentially masculine, the work of man the hunter, reflecting faithfully his aspirations and desires. While vegetable forms are excessively rare, animals proliferate, comprising food animals, birds and fish, together with beasts of prey, such as the cave bear and lion, whose destruction was necessary in the interests of successful hunting. The æsthetics are mainly those of childhood: in the hey-day of the art we have a direct rendering of visual impression, tempered as in so much childish drawing



Fig. 16. Upper Palaeolithic stone relief from Laussel, France: woman holding born. (c. 9/40)

by touches of mental realism, internal organs, for example, occasionally being shown as though visible from the outside. On the other hand in the later stages of the art there was a marked tendency towards conventionalization, particularly in the decoration of small objects, while in central and eastern Europe we meet with fully developed abstract patterns.

Motives are notoriously difficult to analyse, particularly for activities long past, but it is impossible to avoid asking what it was that prompted this earliest art. For much of the work lavished on objects of use, among which the hunter's spear-thrower is prominent (Fig. 12), love of decoration for its own sake is all that need be invoked. This applies equally to some of the mural art, notably the reliefs at Cap Blanc and Le Roc (Fig. 17, upper), which in their original bright colours must have made a rich setting for the winter home

of an early Magdalenian family. Similarly, it is unnecessary to look beyond the gratification of the senses, in this case specifically erotic, to account for the female figurines,

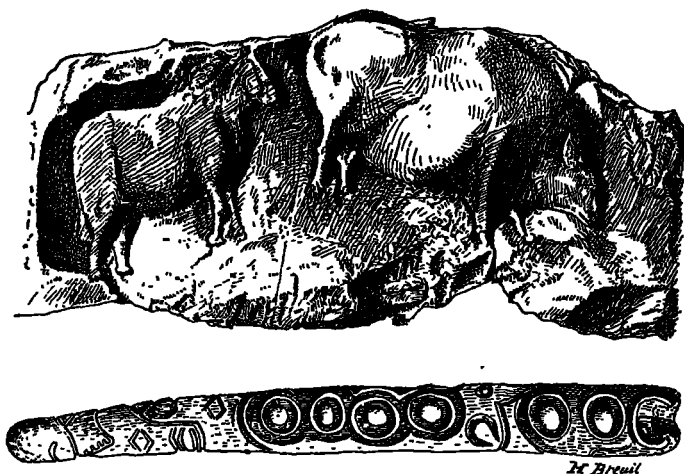


Fig. 17. Upper Palaeolithic art, French caves.

Upper. Stone frieze of bison, La Roc. (c. $\frac{1}{18}$) Lower. Carved antler, Arudy.

the secondary sexual characteristics and the pregnancy of which are emphasized at the expense of such details as the features, the hands and the feet (Figs. 15 and 16). Such figurines are not cult objects, but characteristic products of unregenerate male imagination. In the case of most of the art on the walls or ceilings of caves, however, some rather less straight-forward explanation is needed; animal representations like those of Niaux on the walls of an inaccessible passage, nearly half a mile from the light of day, can hardly be accounted for in terms of home decoration or mere sensuous delight. Such works of art bring us face to face with something of the mentality of primitive man, sympathetic magic, a belief that by delineating a beast, power could be won over it and the way of the hunter made

smooth. Whether we interpret the dead creatures so often depicted by Upper Palæolithic man (Fig. 18) as delineations of wishes or as records of achievement, they indicate in any case a remarkably high standard of observation. Probably not every hunter was equally skilled as a draughtsman or as a magician and we may imagine that the art was mainly executed by exceptional men like the sorcerer represented at Trois Frères, masked with an animal's head, crowned with antlers and cloaked in a tailed skin (Fig. 14, top right). In the darkness, illuminated only by the flicker of an open lamp, we may imagine the hunters watching while the sorcerer engraved the beast on the rock-face and applied the bright colours by brush or crayon, the red and yellow ochres and the black manganese, probably to the sound of incantations. Masked dancers enacted the pursuit and all the incidents of the chase to come, and on occasion the sorcerer engraved the mark of a missile

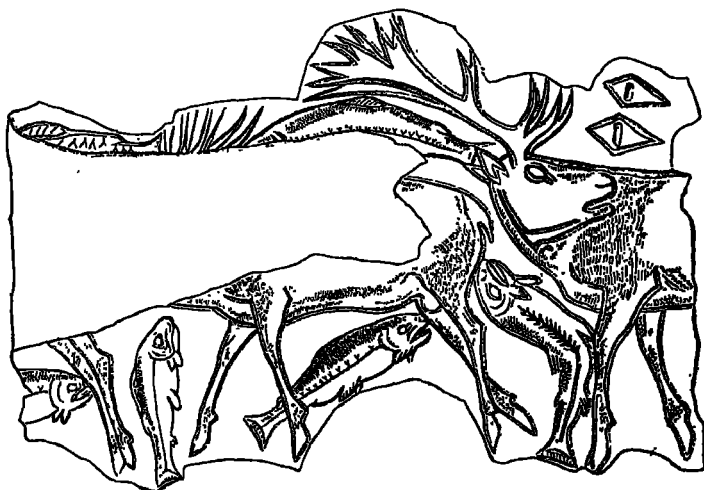


Fig. 18. Upper Palæolithic engraving on stag antler from Lorthet, France.

Note: The engraving has been unrolled so as to appear on one plane.

on the flank of the chosen beast. From the vantage of our superior technology, our automatic weapons, our telescopic sights, we may smile at this play-acting, but to the Magdalenian hunter with his spear and thrower or the Solutrian with his bow and arrow it was real enough, nor need it be doubted that the confidence engendered by these rites steadied his nerves and improved his aim at the climax of the hunt.

Decoration of the person offered another outlet to æsthetic sensibility, of which Upper Palæolithic man took full advantage. To judge from the rare engravings of human figures, it would appear that in Europe he was plentifully endowed with body hair and grew a strong beard. On the other hand there are indications that he sometimes wore animal skins as clothing, which, if needles are any guide, were evidently sewn together to form cloaks, or skirts like those worn by the Mesolithic women of the rock-paintings of Cogul, Lerida, eastern Spain. Textiles were of course, unknown, but in warmer regions vegetable coverings, leaves, bark, fibres and so on, were probably used in place of skins. Indoors and during the warmer part of the year even in sub-Arctic regions it is probable that little or no clothing was worn, other than decorative finery, together with local coverings like that represented on the Venus from Lespugue. Traces of paint on the Venus of Willendorf and on the relief of a woman holding a horn from Laussel (Fig. 16) suggest that body-painting was in vogue. Ochre was reduced to powder in stone mortars, stored in bone tubes and almost certainly applied mixed with animal fat.

The treatment of the hair on the Willendorf and Brassempouy figurines suggests an elaborate form of hair-dressing. Absence of hair-pins makes it likely that the hair was set fairly rigid, fixed with grease or clay. Holes in the head of the Venus of Vestonice may have been intended to carry feathers, and certainly feather head-dresses are

depicted on hunters in the later eastern Spanish art. Elaborate caps of perforated shells and teeth, necklaces, elbow bangles, bracelets, belts or decorated loin-cloths, and knee-bands were the chief forms of ornament, the commonest materials for which were perforated shells and

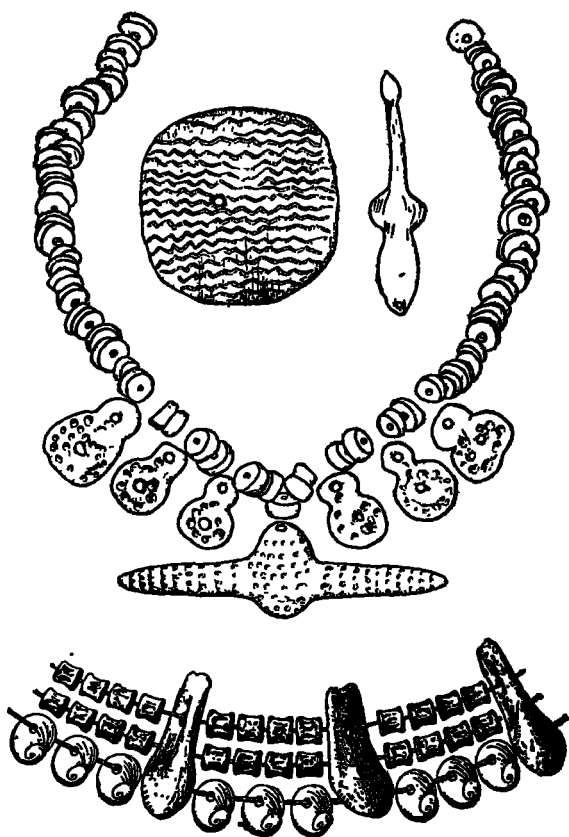


Fig. 19. Personal finery from Upper Palaeolithic burials.

Upper. Child's grave, Malta, Siberia. ($\frac{4}{7}$)

Lower. Young man's grave, Barma Gande, Mentons.

The passing of the Pleistocene era was marked by world-wide geographical changes of great import to early man. Broadly speaking the scene was transformed to something like that with which we are familiar today; ice sheets contracted and withdrew to their mountain fastnesses, the tundra belt retreated to the circumpolar regions, the temperate zone of the northern hemisphere shifted from north Africa and western Asia to Europe, and regions of former parkland were converted into arid wastes. One result of the drying-up of the old hunting grounds and the opening-up of new ones was the setting in motion of widespread migrations, by means of which neoanthropic man vastly extended his geographical range, expanding from the comparatively narrow belt, to which in upper palæolithic times he had been confined, over much of the rest of the Old World and ultimately colonizing the New. It was thus in its final stage that the higher savagery achieved its widest distribution.

Prehistorians have classified the hunting and food-gathering cultures of early post-glacial time as Mesolithic, belonging, that is, to the period between the Palæolithic and Neolithic eras. Over Africa, where in late Pleistocene times he had barely established a foothold, neoanthropic man spread far and wide in his Mesolithic guise, westward from the original focus of the Capsian culture in central Tunisia over Algeria and Morocco to the Atlantic seaboard, and southward by way of Kenya, Uganda, Tanganyika and the Rhodesias to the Cape, where the Wilton and kindred cultures continued to flourish until recent times. The process of diffusion was lengthy and complex, environment varied in the different regions, and cultural groups, too numerous for separate treatment, crystallized out in the vast spaces of Mesolithic Africa. Within the old territories of the Upper Palæolithic hunting peoples in south-western and eastern Europe, the pattern of the Mesolithic cultures was richly compounded of elements derived from indigenous

sources, from overflows from the zone of desiccation to the south, and finally from emanations from the growing centres of barbarism. In the regions north of the old Upper Palæolithic zone, formerly occupied by ice-sheets or inhospitable tundra, vast areas were laid open to the immigration of forests and of men. Here, on the plain of northern Europe stretching from eastern Britain to the Urals and beyond in the great expanses of Siberia, Mesolithic colonizers settled the seashore and the banks of rivers and lakes, their cultural traditions derived from Upper Palæolithic sources, but adapted to life in the forests. It was from this great Mesolithic reservoir that man first overflowed through the funnel of Alaska into the New World, where the old traditions still live, overlaid and modified by later streams of culture, among the Eskimos of the frozen north and in the extreme south among the wretched Indians of Tierra del Fuego.

Hunting continued to provide a principal source of food, and the bow, the use of which could certainly be inferred for at least some of the Upper Palæolithic tribes, was now without doubt the chief hunting weapon. The discovery of a diminutive triangle firmly bedded in the backbone of a Tardenoisian man buried on the little island of Téviec off the peninsula of Quiberon, France, shows that sharp-pointed microliths were used as arrow tips. To avoid damaging the pelts of fur-bearing animals, a special form of bone arrowhead with a conical head was used by the eastern Maglemosians who dwelt in the forest zone between the East Baltic States and the district of Perm. Seals were hunted in the Baltic by means of harpoons, the barbed bone heads of which have more than once been found lying amongst the bones of beasts which had eluded the hunter. Spear-throwers, on the other hand, had evidently gone out of fashion and the bow vividly portrayed in action in the Capsian art of eastern Spain (Fig. 14, lower left), seems largely to have displaced the spear as a weapon

Curved wooden throwing sticks and blunt-ended arrow-heads, tipped with chisel-shaped microliths, like those used by the ancient Egyptians and Sumerians, testify to the continued popularity of fowling, further evidence for which is afforded by quantities of bird bones. Considerable progress was made in angling. The leister or barbed fish-spear continued in use, but the hook was a new feature, albeit still barbless, as was also the net with floats and sinkers, examples of which have been found preserved in Baltic silts. Shell-middens are among the characteristic remains of many Mesolithic groups, whether on the sea-shore, as in Denmark, Scotland, Brittany or the Union of South Africa, the shores of lakes as in East Africa, or the margins of rivers like the Tagus or the oueds of Algeria and Tunisia. Doubtless this concentration on shell-fish was to some extent an index of savagery in decline before the impact of climatic change on the one hand and of competition from expanding barbarism on the other. There are many indications that plant food maintained its importance in dietary: the teeth of the Tardenoisians of Tévéc showed the kind of wear that goes with a strong vegetable constituent, even though they ate plenty of game and shell-fish; carbonized hazel nuts and wild fruits are a common feature of European sites; perforated digging-stick weights are characteristic of the Capsian and Wilton cultures of Africa, as well as of the Maglemosian and Kitchen Midden cultures of northern Europe; and finally, bone sickle hafts with flint teeth indicate that the Natufians of Palestine harvested wild grasses.

Except for midden sites, the fauna from which shows that they were occupied all the year round, thanks to the continuous supply of food, Mesolithic man was compelled to shift his dwelling-place from season to season to satisfy his hunger, in just the same way as his predecessors. Caves, rock-shelters and earth-houses continued to be used in the cold season, but light tent-like structures were used in the summer and among some groups even in the winter

months. Traces of camps on the Pennines suggest that clusters of four or five huts, each with as many occupants, formed the normal social group. Indications of land and water transport include keels and runners of sledges and skis from Swedish and Finnish bogs, a wooden dug-out canoe from under the carse clays near Perth, Scotland, and wooden paddle-rudders from Maglemosian sites in Denmark and north Germany. The value of sledges and skis to the hunter in northern latitudes during the winter months does not need stressing; in such regions the use of dug-out canoes was no doubt confined to the warmer months, and it is suggestive that the paddle-rudders both came from sites settled exclusively in the summer. There is no reason to suppose that either the sledge or the canoe was confined to northern latitudes. Their influence on migration and settlement must have been particularly important among savages with few possessions other than weapons and trinkets, whose very dwellings among some groups may have been tents capable of folding into small bundles.

Technically the Mesolithic cultures show few outstanding developments. The microliths which featured so prominently in Mesolithic flint-work, flakes often of minute size, shaped into a variety of forms by steep, almost vertical secondary flaking, were of Upper Palæolithic origin. Their popularity was due to the increased currency of the bow, the tiny flints being used to tip and probably to barb arrows. In the forested zone of northern Europe the Maglemosians made flint axes and adzes by flaking down nodules rather after the manner of certain lower palæolithic 'hand-axes'. Mounted in sleeves of antler or wood perforated to receive the handle, such implements were mainly used for working wood. The use of antler and bone in conjunction with flint was a novel feature of Mesolithic technology. Bone points with flint flakes inset in slots on one or both edges are known from Mesolithic cultures in northern Europe, Palestine and Siberia, as well as among the Eskimo, like so

many Mesolithic devices. Pottery in the true sense is found only in the later Mesolithic cultures and can usually be shown to emanate from barbarian sources.

Like his forebears Mesolithic man often decorated his implements and weapons, though now with geometrical rather than naturalistic motives. The Maglemosians were fond of building up their decorative patterns by boring small circular pits in the surface of antler. The regularity of this pit-ornament suggests that they used the bow-drill, a device by no means unexpected among a hunting people so wedded to the bow—the Eskimo employ the same means for decorating ivory. Lifelike renderings of animal forms survived, however, in parts of Norway and Sweden, as well as in eastern Spain and North Africa, among laggard hunting groups, while in South Africa the Bushman perpetuated a style of rock-painting, surprisingly like that of Capsian Spain, down to modern times. Shells, perforated animal teeth and bones were still favourite materials for personal adornment. In Europe and western Asia these were employed in a variety of ways, but in Africa finery was reduced to perforated ostrich shell discs, rubbed smooth in stone grooves.

Evidence for a new kind of mutilation is afforded by Oranian and Capsian skulls from Beni-Segoual and Metchael-Arbi in Algeria, from which the central incisors have been removed, possibly during some ceremony of initiation. Head-hunting, strongly suspected for the Upper Palæolithic, is proved for the Mesolithic by discoveries like those made in the cave of Ofnet, Bavaria, comprising nests of skulls complete with lower jaws and one or two neck vertebrae, some of which show marks of cuts (Fig. 20). Of the thirty-three individuals represented, no less than twenty were women and nine were children, showing that the Mesolithic head-hunters, like their modern counterparts, adopted the easy course of securing heads from the weakest victims. From the way the centre skulls were crushed and pushed

<i>Simiidae</i>	<i>Hominidae</i>				Zoo- logical status
Great apes	Sub human hominids	Palaeoanthropic man	Neolithic man (<i>Homo sapiens</i>)		
None	LOWER SAVAGERY		HIGHER SAVAGERY		Cultural status
	Lower Palaeolithic	Middle Palaeolithic	Upper Palaeolithic	Mesolithic	
Collection of plant-food grubs, insects birds' eggs, etc					Subsistence
None					Hunting methods
None					Fishing methods
None (other than human portage)				Canoe & paddle Ski & sledge	Transport
Band of women & children male lord	Monogamous family groups up to 20 persons				Social grouping
Nomadic restricted to forests	Seasonally nomadic, wide range of habitat				
Individual nests for each night generally in trees	Caves rock-shelters and wind-breaks				
None					Industry
None					Intellectual and aesthetic

Table I

together, it is evident that the heads were buried successively and that we are concerned with a long continued practice.

Ceremonial burial continued to be practised by some Mesolithic groups, though in an increasing number of cases the ritual was impoverished. The Ofnet skulls were care-



Fig. 20. Pits of skulls: Ofnet, Bavaria. (After Schmidt.)

fully placed so as to face the setting sun and, as in Upper Palæolithic burials, were accompanied by red ochre and quantities of perforated deer teeth and skulls. Ochre and personal finery, evidently including cloaks secured by bone pins, were buried with the Tardenoisians of Téviec, and one old man was crowned with deer antlers, recalling the sorcerer of *Trois Frères* or the horned deities of the Celtic peoples. Other Mesolithic burials were of the plainest description. The hunting and gathering communities of the Tagus Valley in Portugal were accustomed to bury their dead contracted or lying on their backs under the mounting heaps of cockles, whelks, oysters, scallops and meat-bones, which more than anything else symbolise the bankruptcy of the old ways. While shell middens accumulated on the shores of the Atlantic and the Baltic, farmers were already storing the increase of productive labour in the Valley of the Nile and over extensive areas of western Asia.

CHAPTER IV

PRIMITIVE BARBARISM¹

AT no time since the first hominid utilized a flint or made a fire had man or his forebears conformed entirely to his natural surroundings; indeed culture by its very definition implies some measure of independence from purely natural stimuli, some manifestation of personality and will. Yet, so long as the range of cultural possibility remained as circumscribed as it was under a state of savagery, dependence on nature was oppressively close. Not until he first learnt to domesticate animals and plants and became a farmer instead of a mere food-gatherer, did man's relationship with external nature undergo any fundamental change: only then was he able to move forward from acquiescence and dependence to active, purposeful control and ultimate mastery. So free did man become by virtue of the new discoveries that it is common form to speak of these as revolutionary. From this it must not be imagined that any sudden or dramatic change came over human existence; it may be doubted whether life in the average community of primitive barbarians was much fuller, if indeed it was always as full, as in those of the most favourably situated savages. On the other hand, whereas the possibilities of savagery even at its highest pitch were limited and closed, those of barbarism were boundless. In the beginnings of farming we see in very truth the origins of life as we know it, for barbarism is essentially the foundation of civilization.

Domestication represents of itself a most striking intervention in the processes of nature, involving the breeding

¹ 'Primitive barbarism' is here used to denote the stage of culture through which men passed in the course of evolution from savagery to civilization. As barbarism spread it lost this primitive character. On the periphery it was modified by contact with the higher savagery and nearer the centre by expanding civilization. With the various forms of 'modified barbarism', such as are found in prehistoric Europe, we are not here concerned.

and growth of plants and animals under artificial conditions evolved by man. In contrast with wild forms, the fully domesticated animal is protected from its natural enemies and sometimes even from the weather, provided with food, confined to a selected habitat and, most important of all, bred in captivity. Biologically the domesticated animal may differ from its related wild form in colouring, character of hair, configuration of face, bodily build and generally in such ways as his human master determines through his control of breeding. The control of man over the development of cultivated plants is more direct and the results even more striking: not only have endless varieties been elicited by breeding from the original wild stocks, but the food value of individual species has often been increased beyond measure.

One of the chief advantages gained by man through the domestication of animals and plants is that it has made his food supply more readily available; instead of the long, arduous and not invariably successful quest for wild produce, he has in his farm or garden sources of supply literally on his doorstep. This on the one hand made for greater security and on the other for a greater regularity in food-supply. Admittedly the savage, when his luck was good, could gorge himself to repletion without reducing his stock or impairing his future, but for long periods he would often be compelled to live on the margin of starvation; his subsistence was precarious and gave small scope for foresight or frugality. By contrast, the barbarian, though he might know seasonal stringencies, was in a much better position to plan his diet and foresee periods of shortage. It is worth remembering, also, that the resources which accrued from farming were additional to, and did not entirely displace, those earlier ones upon which man had formerly to rely exclusively. The gathering of wild foods remained a stand-by in periods of dearth and provided at all times a welcome relief from the monotony of diet, which farming did something to emphasize.

One of the most striking contrasts in the economic outlook of savages and barbarians is that, whereas the former regard animals and plants exclusively as booty, to be appropriated, killed and eaten, among the latter there is a well-defined distinction between domesticated and wild types, the former being treated, except in cases of extreme need, as stock of which only the increase is consumed. Whereas to the savage his quarry is of value only when it is dead and has lost its capacity to increase, with the barbarian his domesticated animals and plants are carefully tended and sheltered from potential enemies. They are no longer victims so much as property. By breeding animals in captivity and appropriating their natural increase, man in effect draws dividends from the cycle of animal life, obtaining for himself the solar energy stored up in the vegetation consumed by his livestock. Moreover, within the limits of naturally available food-stuffs, he could enlarge his animal stock, while at the same time consuming its by-products and a proportion of its increase. Even more profitable was the cultivation of plants, since not only was the annual increase very much larger, but the control was more direct, and the possibility of enhancing this increase through selective breeding was correspondingly greater. All in all the principal economic characteristic of farmers as opposed to food-gatherers is that, whereas the latter consume whatever foodstuffs they can wrest from wild nature, the former discriminate between capital and income, consuming the increase of their fields and herds, but encroaching on their stock and seed only in direst necessity.

One consequence of domestication was to render possible a substantially greater density of population. Under a food-gathering economy great tracts of country might be necessary to support a single family group, but among farmers even at a primitive stage of development the same area would, if situated in a geographically favourable zone, produce food sufficient for a much larger number of

persons. Moreover, the greater accessibility of food and the enhanced assurance of its supply made for larger aggregations of population, so that instead of fifteen to twenty persons one might expect to find communities of up to 200 or 300. This in turn allowed greater economic specialization. Under conditions of primitive barbarism the sex division remained of paramount importance, the men concentrating on livestock, hunting and war, the women on the cultivation and collection of plants and on such domestic industries as potting, basket-making and weaving. Yet, within this age-old division into male and female spheres, the advantages of specialization according to aptitude must early have made themselves felt once the community was of sufficient size to make it practicable. In so far as increased specialization of function was possible—and under primitive barbarism the scope was still limited—this must ultimately have led to technical developments, which in turn would enrich life, amplify still more the food supply and so assist anew the higher integration of society. Weaving, potting and the polishing of flint are some of the new crafts which help to mark the achievement of barbarism.

Another characteristic of primitive barbarian societies is that they were fundamentally more settled than those remaining in a state of savagery. The contrast between the settled farmer and the roving food-gatherer, indeed, so impressed some writers of the Victorian evolutionary school that to bridge the gap they interpolated an intermediate stage of pastoral nomadism, when man began to enjoy the fruits of domestication while retaining his old nomadic habits. Research has proved this sequence to be illusory. The earliest farming economy of which we have evidence, was mixed, combining in varying proportions the two elements of plant-cultivation and stock-raising. Pastoral nomadism, so far from being primitive, is in fact a highly specialized way of life, adapted to steppe and

desert regions, where in some cases it has maintained itself down to modern times.

Although cultivation of the soil made for a settled life and so laid the basis necessary for the rise of civilization, it is important to realize that under conditions of primitive barbarism farming, except in especially fertile regions like the Nile Valley, was extensive rather than intensive, necessitating the frequent breaking up of new ground and the periodical shifting of settlement. Nevertheless, in the long run, farming did foster numerous developments, which under exceptionally favourable conditions led in due course to the achievement of civilization. A more settled life fostered architecture, facilitated the accumulation of property, promoted a greater diversity of culture and by emphasizing local deficiencies in raw materials led the way to an expansion of trade. Again, while among primitive barbarians the community was characteristically one of social equals, the enhanced possibilities of accumulating wealth and the added inducement for conquest created by settled life both tended in the long run to social inequality and the stratification of classes, a tendency greatly increased by the effects of war.

The new economy was accompanied by fresh ideas. Fertility replaced hunting-luck as the paramount aim of magic and attention was orientated to any phenomena which might be supposed to affect the increase of crops or herds. Cultivation of the soil first induced an appreciation of the fertilizing and vitalizing power of water, which in turn led, not only to the veneration of springs, but in due course to irrigation. The importance to husbandry of an accurate watch on the seasons and on the lapse of time caused men to link with their own destinies the sun, the moon and the heavenly bodies in general, which became the focus of cults and ultimately of the science of astronomy. In art the virile products of hunting magic gave way to cult symbols and the repetitive pattern-making of female potters, weavers and basket-makers.

It is natural to look for the origins of agriculture in the conditions of savagery, since it was among savages that the first discoveries must have been made. To begin with, it must be clear that the very dependence of man under savage conditions, itself promoted that close observation of nature, which we saw reflected in the Upper Palæolithic art of western Europe, and it was only through intimate acquaintance with the life habits of animals and plants that man could ever have arrived at their domestication. It is evident also that the division of economic functions between the sexes, which was characteristic of savagery, helped to restrict and focus interest, the men on animals, the women on plants. Although revolutionary in its implications, domestication was not itself achieved by a revolution, but evolved by insensible gradations from gathering and hunting, through the building up and extension of proprietary rights. In the case of plants it is easy to imagine how the women of a collecting band might earmark and gradually establish exclusive rights over, say, a patch of wild grasses, and how, through collecting the seed for food and carrying it home they might, at first unintentionally, have sown it close at hand and so established what was in effect a garden, which the refuse of living would make exceptionally rich. Furthermore, many of the leading implements of primitive husbandry were of savage origin: the digging-stick, evolved by savages for grubbing up wild roots and plants, served the earliest food-planters for breaking up the soil; the sickle with flint teeth set in a slot was used by the Natufians of Palestine, presumably for wild grasses, and belongs to a well-known mesolithic tool-family; and the pestle and mortar were already employed by Upper Palæolithic man to pulverize his pigments. The domestication of animals, like that of plants, arose through the extension of ownership and protection over wild forms, a tendency which may have been furthered by the concentration of individual hunting

groups on the pursuit of a particular species, such as we met with in Upper Palæolithic Europe. An incipient stage of domestication is still practised by the Chukche, groups of whom attach themselves to individual reindeer herds, protecting them from animals of prey and jealously reserving them from other groups of hunters. Among the Siberian tribes whose economy is linked with reindeer, every gradation may be found between a hunting and a pastoral relationship, and it is noteworthy that crossing between 'wild' and 'domesticated' reindeer occurs freely.

The earliest centres of the new economy are all found in the zone stretching from North Africa to Syria, Iran and Turkestan (Fig. 21), today among the driest in the world, but which in Pleistocene times enjoyed a rainfall similar to that now prevailing in the lands bordering the northern shores of the Mediterranean. That this should be so is no accident, since it was precisely the shifting of climatic zones that gave the impetus for domestication: growing scarcity of wild foods and the enforced association of man and beast in the dwindling oases sharpened necessity and at the same time increased opportunity. Moreover, it was precisely in this area that the progenitors of the cereal grains and the domesticated animals, on which the earliest farming economy was based, flourished in the wild state. Speculation as to the original home of farming has, indeed, revolved to a large extent around the distribution of these species. Judging from existing distributions, the balance inclines on the side of western Asia, but much remains to be learnt about the former spreads of animal and plant species in Afrasia as a whole. If the subsequent history of domestication in eastern Asia and the New World is any guide, it is unlikely that all the species concerned were domesticated in any one area.

Excavation in Egypt, which at the close of the nineteenth century had unveiled the tombs of the First Dynasty and in the cemetery of Naqada had opened up a new field of

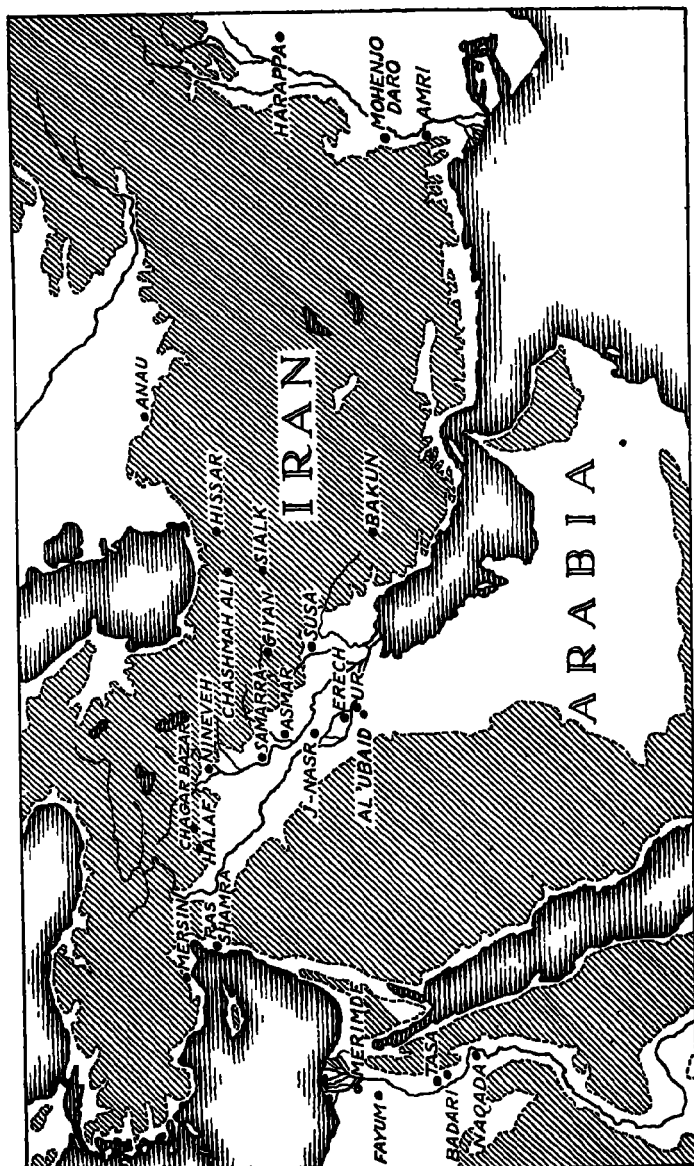


Fig. 21. Centres of primitive barbarism and dawn civilization

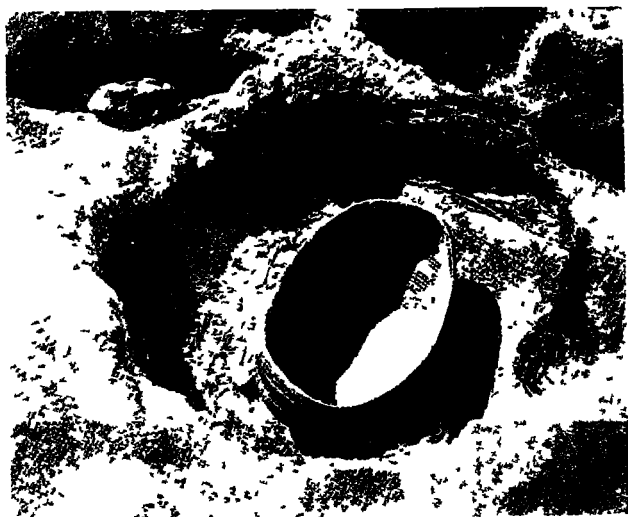
investigation on the Predynastic period, brought to light in the nineteen-twenties traces of some of the most ancient and primitive barbarian societies at present known. By combining the evidence obtained by Brunton at Badari and Deir Tasa on the eastern bank of the Middle Nile, by Caton-Thompson on the shores of the ancient lake of the Fayum in Lower Egypt, and by Junker at Merimde-Benisâlamé on the desert margin of the western Delta, it is possible to visualize with some accuracy the economic life of farming communities which flourished between six and seven thousand years ago.

Settling the margins of river and lake, the early pioneers were able to combine hunting and fishing with primitive farming and so experiment in the new economy, while relying to an appreciable extent on the old. The bow and arrow was the favourite weapon. With it were shot antelope, gazelle, and also the hippopotamus, if we may go by the skeleton found in the Fayum lake-bed with a flint arrowhead in its ribs; certainly hippopotamus meat was eaten by the Merimilians and the Fayumis. Sling-stones from Merimde and a pair of throwing-sticks, buried close by the hand of a Badarian, indicate fowling. Fish were caught by hook and line in the Nile and in the Fayum lake by spearing. The Fayumis took shellfish from their lake (*Spatha cailliaudi*), eating the flesh and using the valves for scoops. The Badarians gathered the wild castor oil plant (*Ricinus communis*), from the seeds of which they obtained oil for anointing their bodies.

Although oxen, sheep, goats and, among the Merimilians and Fayumis, pigs were kept, the comparative scarcity of bones and dung suggests that domestic animals played only a small part in economic life. Cultivated cereals, on the other hand, were of primary importance, as shown by the equipment for harvesting and threshing and, above all, by the arrangements for storing grain. Although it is possible that some of the earliest farmers by the Nile

merely scattered seed on the wet mud left by the annual inundation, like the semi-nomadic Hadendoa of modern times, there is some evidence that the Fayumis tilled the soil with flint hoes. The cereals grown comprised Emmer wheat (*Triticum dicoccum*), six-rowed barley (*Hordeum vulgare*) and two-rowed barley (*H. distichum*), which in the Fayum, where alone the grain survived in any quantity, occurred in the approximate ratios 2:6:2. The corn was harvested by means of sickles with saw-edged flints set into slotted handles of wood (Fig. 22, lower mid.); to judge from scenes painted on tombs of the Dynastic period the heads were grasped in the free hand and severed high up the stalks by means of a saw-like action. Threshing was done on the ground or on prepared floors sunk below ground level and walled with mud, like those found at Merimde. Sticks of tamarisk wood from one of the Fayum granaries may have been used for threshing and some of the open baskets from the same source may have served for winnowing, but the high proportion of grains retaining husks denotes a low level of efficiency.

Elaborate arrangements were made to store the threshed grain. Both Merimilians and Fayumis used circular pits, sunk in the ground and lined with coiled matting of corn straw worked in one piece, starting from the centre of the silo floor and ending at the rim, and stuck tightly to the walls by mud and dung plaster to keep out unwanted vermin (pl. III). As an alternative the Merimilians made large oval silos lined with clay walls up to six inches thick. The more sophisticated Badarians made free-standing bins of beehive shape from sun-dried clay, with large apertures at the top closed by limestone slabs. These silos, primitive though they are by comparison with the modern grain elevator, nevertheless symbolize that control of food-supply which was conferred on man through the domestication of the noble grasses, and remains the foundation and basis of western civilization. The grain was ultimately reduced



*Plate III. Basket-work granary and basket, Fayum, Egypt
5th millennium B.C. (After Caton-Thompson.)*

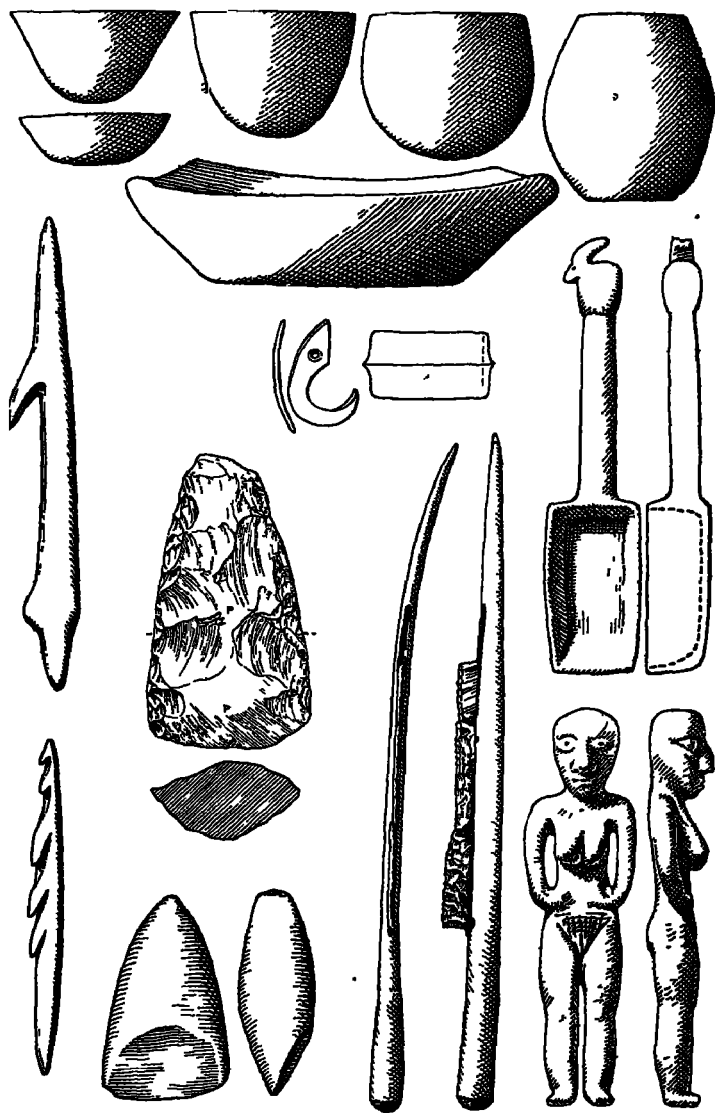


Fig. 22 *Primitive barbarian equipment of the Nile Valley.*
(After Brunton and Caton-Thompson.)

to flour by a stone rubber pushed back and forth on a recumbent stone slab known as a saddle-quern, one of the most significant of the new devices which appeared with farming (*cf.* Fig. 23, bottom left).

At the Fayum two groups of silos were excavated, comprising 67 and 98 respectively, each on the average holding 8 cwts. of grain, the yield, probably, of from two to three acres. Unfortunately there is no means of telling how many silos were in use at once, nor have we any idea of the number of dwellings associated with them, either at any one time or in sum total. Lacking this information, it is not possible to determine with accuracy, either the size of the community or the part played by cereals in the composition of diet. On the other hand, the mere existence of silos of this character implies a certain fixity of settlement at least for a few years at a stretch. Yet there is nothing to suggest substantial dwellings such as are associated with long continued settlement on one site. All the indications are of tent-like structures of matting supported on light wooden posts, like those erected over many Badarian burials.

Industrially the Tasians, Fayumis and Merimdians were of the stone age; ignorant of metal in any form, they relied on flint and stone and a wide range of organic materials for their equipment. The Badarians, it is true, were acquainted with copper, but although they hammered it into shape, they had not yet discovered how to melt or smelt and mould it to any form required; they had not indeed discovered any of the real secrets of metallurgy, and relied for all but a few beads and pins on a stone age equipment. In the field of flint and stone-work the primitive barbarians can show no fundamental technical advance over the higher savages; even the polishing of flint, applied by the Fayumis to axes, adzes, hoe-blades and knives and regarded by some archæologists as one of the hall-marks of the Neolithic or New Stone Age, represents no more than

an extension of the technique of polishing from bone or antler, familiar to Upper Palæolithic man. It is, therefore hardly to be expected that we should find much evidence of technical development in the working of the organic substances shaped or prepared by flint or stone, such as antler, bone or wood. On the other hand, conditions have preserved to us evidence of activities, such as leather-working, which can only be inferred from earlier times. Basketry is another craft of which palpable evidence exists for the first time, not only in silo-linings, but also in a variety of smaller receptacles and open lids.

Weaving and potting were two of the greatest contributions of primitive barbarism to the arts of life, innovations which in their full development reflect the attainment of a new mode of living. For a textile industry to flourish, sources of fibre more prolific than those afforded by a natural collecting economy were necessary, such as the wool yielded by the domestic sheep or the cultivated flax (*Linum usitatissimum*), grown by the Fayumis and the Badarians and woven by them into fabrics. The craft of potting, like that of weaving, reflects a certain sub-division of labour, and the general use of pottery normally goes with a settled mode of existence. Pots were plentiful among the primitive barbarians of Africa, although never so common that they were not on occasion repaired by passing threads through rivet-holes. As a rule the pots were open bowls of the simplest form (Fig. 22, top); frequently they had rounded bases, but at Merimde flat ones were in a majority, while a few pots from this site and from the Fayum even had footed bases. Rims were plain and handles, where present, were of the rudimentary lug variety. Decoration was rare, though beaker-like vessels with rounded base and flaring rim from Tasa were incised with patterns reminiscent of basket-work and emphasized by white incrustations, while some Badarian bowls had designs lightly tooled on their inner surface. The better pots were made from finely prepared paste, but the

cooking vessels were of coarser ware mixed with chopped straw. All were shaped entirely by hand. The best ones were treated with a slip and then burnished by a pebble. Ladles were found at Merimde and at Badari, the former made of pottery, the latter of ivory carved with an animal's head.

Burial of the dead was by inhumation and the body was placed in its grave clothed, in an attitude of rest, the limbs loosely flexed. Many differences of custom obtained among the various groups; thus, whereas the Merimilians buried their dead among the huts and orientated them as a rule to face east, the Badarians buried theirs away from dwellings and generally set them to face west. In every case the burials were individual or in small groups; as yet there is no suggestion of the extensive cemeteries characteristic of Predynastic and Dynastic times, which arose when settlement became more truly fixed.

Owing to the way the Badarian corpses were preserved in the dry sand, we know that the men were beardless, though not necessarily shaven, and that the women sometimes plaited their hair and occasionally wore curly fringes down to the eyes. Curved ivory combs were probably worn in the hair. The Badarians used malachite for painting round their eyes to make them more prominent and probably used rouge as well. The pigments were ground on slate palettes by polished pebbles. Similar palettes made of various stones were found at Merimde, the Fayum and Tasa. The bodies were decked with a variety of personal ornaments, nearly all of them common to the higher savagery, such as the necklaces of beads and shells worn by the women, the girdles and circlets of shells favoured by the young girls and the ivory bracelets worn on the forearm by men as well as women. Again, the love of perforated shells, animal teeth and fish vertebrae conforms exactly to the taste of Upper Palæolithic cave-dwellers, while the beads made from discs of ostrich shell used by the Fayumis and Badarians were fashionable among the Capsians of

north and east Africa. Only in the use of ear-studs and beads of glazed steatit² and copper by the Badarians do we find really novel elements. Clothing consisted of an under garment of linen with outer garments of animal skin, the latter another legacy from savagery. Goat, and probably gazelle, skins were favoured by the Badarians, who almost invariably wore the hair innermost to conserve warmth. Traces of seams and plaited thongs show that we have to imagine regular cloaks or carosses, rather than mere skins.

The earliest farming communities of Egypt were to a large extent self-sufficient. As in Upper Palæolithic times, trade was confined almost entirely to material needed for personal adornment. Just as the cave-dwellers of southern France imported shells from the Mediterranean and the Atlantic, so the Fayumis drew theirs from the Mediterranean, the Red Sea and the Indian Ocean. The source of the turquoise sought after by the Fayumis and the Badarians cannot yet be definitely located, but the malachite for eye-painting almost certainly came from Nubia or Sinai. Clay models of boats from Badarian graves are the only clue we have to transport, which appears to have remained as backward as in some communities of higher savages.

Although better stocked than north Africa with wild animals and grasses amenable to domestication, western Asia has yielded only the scantiest traces of farming communities as primitive as those of Merimde or the Fayum. Probably this is because the earliest farmers, shifting their settlements at fairly frequent intervals and building dwellings of light and perishable materials, have left very little behind. The attention of archæologists has naturally been attracted to the prominent settlement mounds or tells, built up from the accumulated debris of successive layers of sun-dried brick, interleaved with sand and dust blown up during periods when the sites were temporarily abandoned. It is only from the lowermost layers of such tells, which themselves symbolize a settled mode of life

with more or less durable buildings, that traces have been found of the old shifting agriculturalists. indeed, the only culture yet recognized as certainly Neolithic in the whole expanse of territory from the Mediterranean to the Indus Valley is that represented by the burnished monochrome pottery, decorated with horizontal rows of concave shell impressions, from the base of the settlement-mounds of Ras-Shamra, Mersin and Tell Chagar Bazar in Syria. The makers of this hole-mouthed and lug-handled pottery evidently lived in some light form of hut which has disappeared without apparent trace.

Rather more is known of communities at an industrial level comparable with that of the Badarians, utilizing copper for personal ornaments and various small objects, but ignorant of metallurgy in the true sense and dependent on flint or stone for shaping organic materials. Two of the sites which have taught us most are those of Anau, on the margin of the Kara-kum desert near Merv in the Turkoman Republic, excavated in 1904 by an American expedition led by Pumpelly, and Sialk, near Kashan, on the western rim of the desert basin of the Iranian plateau, explored by the French archæologist Ghirshman between 1933 and 1937. At both there are twin mounds and in each case the northern one is the more ancient. Cultures, broadly contemporary, and at a comparable economic level, have been traced at many sites on the Iranian plateau with extensions, eastwards to Waziristan and Baluchistan, and westwards to the piedmont of Assyria (Nineveh I) and Syria (Mersin XVII). Mesopotamia proper—the ancient provinces of Akkad and Sumer, built up from alluvium of the Tigris and Euphrates—appears to have been settled for the first time by people at a rather more advanced stage of development.

The general pattern of culture, ignoring the diversities which the assumption of a settled life did much to promote, conforms in its broad outlines to that already described

for Egypt. In the earliest levels of the tells we catch a fleeting glimpse of peoples at the point of entering on a settled mode of existence, whose economy was based on farming, but who still relied to some extent on hunting. The excavators of Sialk noted that at the base of the mound there was no trace of dwellings. The first settlers evidently utilized perishable organic materials, although these light and easily moved structures were soon to be replaced by others more permanent, of mud construction. The earliest settlers at Anau bred pigs and sheep, those at Sialk cattle and sheep. Later settlers added goats and camels (Anau II) and pigs and horses (Sialk II). Hoes and digging-sticks, weighted by perforated stones (Fig. 23, lower left), like those of the Capsians, were used for breaking up the ground. The principal crops were wheat and barley. Grain was cut by sickles like those used by the Mesolithic Natufians and the Neolithic Fayumis. The farmers at Sialk were fond of carving an animal's head at one end of such a sickle-handle as Fig. 23, top right, in true Natufian style. Cereal grain was reduced to flour by saddle-queerns, and the pestles and mortars from Sialk may have been used for preparing special plant foods (Fig. 23, bottom). Clay sling pellets show that fowling was popular, but little hunting equipment has survived, though microliths from Sialk probably served to barb or tip arrows, and the stone maces may have been used to despatch wounded victims (Fig. 23, top middle).

Metal was absent from the lowermost levels at Anau and Sialk, and it may be that the first settlers should rank as truly 'Neolithic'. Yet it should be remembered that, when metal first came into use, it was rare and highly prized, so that negative evidence on this point is difficult to evaluate. What is certain is that the people who settled the northern mounds at both sites were ignorant of metallurgy in the true sense of the term: only copper was known¹ and this was merely hammered into shape, its use moreover

being confined to such small objects as pins or beads (Fig. 23, lower right). Like the Badarians, the early settlers of Anau and Sialk were to all intents and purposes still living in the stone age. Flint and stone were extensively used and the latter was both polished and perforated. Stone axes testify to the working of wood and fired clay spindle-whorls (Fig. 23, middle right) to weaving, even if no actual textiles have survived. Pottery attained a high pitch of excellence, though made without the aid of the wheel. Among the pottery in contemporary use were rough undecorated wares, red wares sometimes plain, sometimes decorated with black paint, and pale wares with designs in black paint. Much of the best pottery from Sialk I clearly recalls basketry, both in form and still more in the patterns painted on its surface (Fig. 23, top left). As in Neolithic Egypt, bowls of simple shape were sometimes made from stone. Objects of personal adornment comprised shell beads and rings, stone bracelets and beads, including turquoise from Anau I and Sialk II, and pins and beads of copper. At both sites the dead were buried without grave goods in a contracted position under or among the houses, and at Sialk they were coated with ochre as in the Upper Palæolithic times. Apart from traffic in some of the materials used mainly for personal adornment, the earliest farming communities of western Asia, like those of Egypt, were self-sufficient, relying on a strictly local production.

The communities of primitive farmers, whose existence in western Asia and Egypt has been established as far back as the 5th millennium B.C., while differing from one another in cultural expression, shared a common heritage and held out a common promise for posterity. The discovery of domestication, by transforming Mesolithic savages into Neolithic barbarians, prepared the way for civilized man. Barbarism was indeed the very seed-bed of civilization.

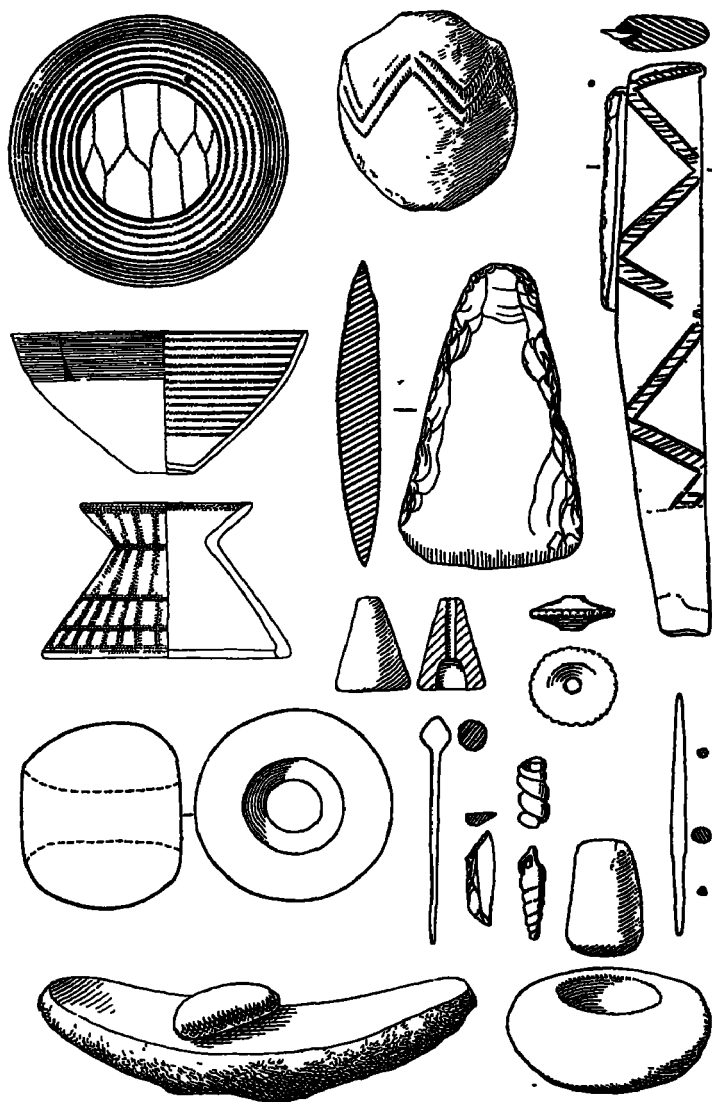


Fig. 23. Primitive barbarian equipment: Iran (Sialk) and Turkestan (Anau).
(After Ghirshman and Pumpelly.)

CHAPTER V

ORIGINS OF CIVILIZATION

THE origins of civilization, which may be defined as essentially the culture of cities, are to be sought in the development under certain special conditions of those early manifestations of barbarism studied in the previous chapter. Successive stages in the original transition from barbarism to civilization have been defined by archaeological research during the last fifty years, both in the Valley of the Nile and in Mesopotamia and the surrounding piedmont zone.¹ Evidence for sub-dividing the Predynastic period, which marked the time of transition in Egypt, has been obtained mainly from the excavation of a series of cemeteries, the first of which was explored by Sir Flinders Petrie at Naqada in 1895. By painstaking study of the development of certain features of the objects buried with the dead, Petrie was able to devise a relative, if arbitrary, chronology, by means of which it is possible to arrange the burials in their correct sequence. Thanks to these 'sequence dates', we can trace the technical development of Egyptian culture within the limits of surviving evidence down to the time of the First Dynasty, the absolute date of which is usually set at $3,000 \pm 100$ years B.C. The length of the Predynastic period can only be guessed. Estimates range from 500 to 2,000 years, but it is probable that the Fayumis, Merimilians and other primitive barbarians go back to the 5th millennium B.C. The main sub-divisions with their sequence dates (S.D.) are as follows:

¹ Much remains to be learnt, particularly about the antecedents of the rich and distinctive civilizations of India and China.

EGYPT

<i>Civilization</i>	1st DYNASTY (accession of Menes)	S.D. 79	3,100 ± 100 B.C.
<i>Transition</i>	SEMAINIAN (late Predynastic)	S.D. 63-76	
	GERZEAN (middle Predynastic)	S.D. 43-62	
	AMRATIAN (early Predynastic)	S.D. 30-42	
<i>Primitive barbarism</i>	BADARIAN FAYUM, MERIMDIAN, TASIAN	Pre- S.D. 30	5th millennium B.C. ?

For western Asia our best sources are the settlement mounds or tells, the stratified layers of which provide a ready sequence of stages. To make references in the text more easily intelligible, the broad succession at key sites in each of the main areas have been tabulated in parallel columns, arranged so far as possible to synchronize. Here, again, absolute chronology, prior to the beginning of the dynastic period (3,100 ± 100 B.C.), remains speculative.

	IRAN (Sialk)	ASSYRIA (Nineveh)	SYRIA (M Mersin RS Ras Shamra)	MESOPOTAMIA (Ur)	
<i>Civilization</i>	IV, b	V		EARLY DYNASTIC	3,100 ± 100 B.C.
<i>Transition</i>	IV, a III, b	IV III, c		JEMDET NASR URUK	
	II, b/III, a	(HALAF) II, b (SAMARRA)	{ M XVI RS IV	AL' UBAID	
<i>Primitive barbarism</i>	I/II, a	I/II, a	M XVII-XIX RS V	(Unoccupied)	

Since the growth of cities, the most palpable index of civilization, was made possible only by an ability to concentrate population in a way not attainable for any prolonged period under conditions of barbarism, it is evident that the origins of civilization must be linked closely with the causes of increased density of population. In early times the determining factor was the quantity of food regularly available: any advances in food-production, by diminishing

the area necessary to support a given population, automatically increased its potential density, which under barbarous conditions was tantamount to increasing it in fact. Improvements in the means for transporting food-stuffs only tended to accentuate the process. In the final analysis, therefore, we can only account for the increased density of population, which accompanied the development of urban life and ultimately of civilization, in terms of improvements in the production and distribution of food.

The possibility of civilization was inherent in barbarism by virtue of the capacity for accumulating capital conferred by the discovery of domestication. Yet without favourable conditions its emergence might have been long delayed, instead of occurring within probably two millennia of the first attempts at farming. Both in Egypt and Sumer circumstances were such as to favour the early adoption of irrigation; in both, natural inundations of the great rivers, on which life depended, increased fertility so markedly as to make evident the value of extending their benefits by artificial means, and in both the proximity of desert to the irrigated zone served to enhance the contrast. If at first artificial irrigation was practised only on a restricted scale, the increase of population which it made possible must itself have provided the man-power necessary for its further extension, until it came soon to occupy a foremost place in the economic regimes of these favoured regions.

Another factor in enhancing the productivity of farming was the introduction of the traction plough, which increased the area of land cultivated for each unit of human labour employed. The precise time and place of the great new invention cannot yet be determined, but it is significant that representations of the plough appear in both areas early in the Dynastic period, on Egyptian tomb-paintings and on Sumerian seal-engravings. The earliest ploughs were evidently of wooden construction, consisting essentially of

a wedge, guided by two handles and dragged through the soil by a beam yoked to a pair of oxen. The principle of harnessing animal power, applied to the plough, was an innovation of great importance symbolizing the union of stock-raising and cereal cultivation and adding greatly to the power available to mankind.

Improvements in the productivity of farming reduced the economic role of gathering, but there is no certain evidence that plants other than cereals and flax were fully domesticated prior to the establishment of civilization, so that the collection of plant food probably retained much of its importance during the period of transition. The domestication and cultivation of the vine, the olive and a wide range of vegetables, such as peas, beans, asparagus, onions and so on, were innovations of civilization. Fishing remained important, helping to vary diet, and hunting retained some economic significance as a safeguard for domesticated stock and growing crops, as well as a source of raw materials, such as skins, antlers and ivory. It is interesting to note, by the way, that hunting has survived longest in civilized societies, not among the most degraded strata of the people, but among those best able to gratify their tastes.

Lasting fixity of settlement was one of the prerequisites of town life made possible by basic improvements in subsistence, which rendered superfluous seasonal migration or even periodical movement. Eloquent of this change are the tells of western Asia composed in large measure of the debris of settlement on the same site, accumulated over a period of time. In the sequence of strata on which the first cities rose above the plain we can trace the development of settled life. One effect was to stimulate the substitution of durable for perishable materials in building construction. This abandonment of organic for inorganic substances, which at all times and places has marked the transition from barbarism to civilization, naturally affected first buildings of foremost social importance, temples, palaces and the like, penetrating

more slowly down to the wider field of domestic architecture, and as a rule began with the foundation and ended with the roof. The earliest settlers of Sumer lived on low mounds close by the ancient course of the Euphrates in houses made from arched bundles of reeds or constructed from a framework of palm-stems hung with matting plastered with mud and dung, both types which survived among Iraqi peasants down to the present day. Already in the Uruk period we meet with great temples, reproducing many of the features of the primitive huts, but built of brick on a grand scale. The courtyard wall of the great Red Temple of Erech, relieved by half columns, recalls the screen of palm-stems with intervening mats, and the mosaic encrustation of the columns evidently imitated the natural features of the stems. Again, the clay cones pressed into the face of the wall-zones for decoration derive from the clay 'nails' used by peasants to peg matting to the clay facing of their huts. By an analogous process Greek temples and Gothic cathedrals were later to arise from wooden prototypes.

Growing density of settlement also made itself felt in relation to water supply. Whereas under conditions of savagery man retained the same outlook as wild animals, seeking water where it was naturally available and pitching his camp or seeking his rock-shelter in proximity to river or spring, so soon as he attained to farming his attitude began to change. No longer was he content to conform passively to the dispensations of external nature, but adopting an active role he sought to remedy deficiencies in his habitat by artificial means. Yet, it is significant that so long as he remained in a state of barbarism his control over water-supply was rudimentary, being limited to reinforcing the sides of natural spring-heads by means of stone-packing or a short section of hollow tree-trunk, so as to promote the flow of water and make it easier to scoop up in containers. As in so many fields the achievement of farming did not of itself lead to a revolutionary change of outlook. It was the

development of urban life which stimulated and indeed necessitated drastic intervention in the matter of water-supply. The concentration of large numbers of people in single centres not only rendered surface supplies inadequate, but also caused their contamination. Moreover, the growing density of population caused settlement to be extended to areas deficient in natural springs. Of the two expedients by which these difficulties were surmounted, the conduct of fresh water from a distance in aqueducts and the tapping of subterranean supplies by means of wells, the former was no doubt suggested by irrigation, itself a process closely linked with the origins of civilization. Well-sinking, on the other hand, represents a dramatic exercise in creative will, a demonstration in human control over nature, such as we associate with the achievement of urban life. Already in the Uruk level at Tepe Gawra there was a well lined with mud plaster to a depth of 23 meters and provided with foot-rests in its lightly battered walls. Leading from the well towards the inner part of the settlement were conduits built of stone slabs and waterproofed by a lining of bitumen.

An outstanding consequence of improved methods of food-production was the freeing of man-power for other activities. At the same time greater density of settlement made specialization more effective by widening the range of craftsmen with special aptitudes within a given community. Specialization in turn made for technical improvements and allowed the production of that wider range of possessions for which fixed settlement first gave adequate scope. Technical advances reacted on efficiency of food-production and so further increased the surplus available for craftsmen. Moreover, each step in technical progress engendered others, both by increasing the germinative stock of devices and ideas and by creating artificial standards for the attainment and eclipsing of which society became geared to further effort. The poorer strata within advanced societies strove continually to attain the level of

the richer, and rulers in the outer barbarisms sought to imitate the common usages of civilization. Thus, by a process of devolution the basis of civilized economy was broadened, while at the top the tempo of technical advance was quickened.

The speed and scope of technical development during the period of transition from the primitive barbarisms, hardly more advanced than the most evolved savage societies, to the earliest civilizations of Egypt and Mesopotamia was too great to make it possible for us to notice more than a few of the more striking innovations. The evolution of potting can be traced particularly clearly. Among primitive barbarians pots were shaped entirely by hand, but already the villagers of Al 'Ubaid had thought of setting the clay on a board revolved by one hand, while the other was busy modelling; for shaping the foot-rings which they added to some of their pots before firing they even used a slow-moving wheel or tournette. By the Uruk stage the true wheel, weighted for velocity and propelled either by an assistant or by the potter's feet, leaving both hands free, had come into use in Sumer, a device which greatly increased the output and set new standards for regularity of shape. It is interesting to note how technical development was reflected in changes of social status: the making of pots passed from the hands of housewives to those of skilled craftsmen. As the great clay-domed kilns discovered by Woolley in Halafian levels at Carchemish show, potting was already passing from a domestic art to an industrial process before the wheel had been introduced to Syria. The greater speed and economy of the new device only served to hasten the evolution of a distinct class of craftsmen specializing in standard wares.

Great progress was also made in the working of stone. The small bowls made by the primitive barbarians were little better than the mortars of the higher savagery, but during the transition to civilization such mastery was

achieved in the shaping of stone vessels that we find them serving as prototypes for pottery. Relief sculpture, such as that on the famous vase from Erech dating from the period of Jemdet Nasr, on which priests are shown bearing offerings to a goddess, or carvings in the round, like the well-known boar from the name-site Jemdet Nasr itself, are further signs of technical advance. Even more remarkable was the shaping, drilling and engraving of the cylinder seals (pl. IV) which first came into fashion in Sumer during Uruk times. Such achievements in stone of course imply the use of metal tools.

The effects of the discovery of metallurgy were felt through the whole realm of technology. Knowledge of how to reduce copper ore, so that the metal could be conducted in a molten state into moulds prepared to the shape of tools required for daily use, marked the greatest advance in man's equipment as a craftsman since he first learnt to work flint. The use of metal tools enormously enhanced his mastery of stone, wood and a whole range of substances. Precisely when and where the great discovery was made is not yet determined. All we know for certain is that, both in Egypt and Mesopotamia, the casting of copper, as distinct from its cold hammering, first appeared during the period of transition from barbarism to civilization. Whereas the Badarians used small quantities of native copper for such articles as pins and beads, the Gerzeans of the Nile Valley were already casting copper for adzes, chisels and knives, as well as razors, needles and tweezers. In Sumer metallurgy can first be proved for the Uruk stage, although almost surely practised by the Al 'Ubaid people; certainly it was known to the late Al 'Ubaid community at Arpachiyah, near Nineveh, and it was widely practised by the Halafians of Syria and Assyria. The advantages conferred by metallurgy were much enhanced by the discovery of bronze, the addition of tin making an alloy of superior toughness from which tools and weapons could be made

with a keener and more enduring edge. Bronze was certainly an Asiatic discovery, since, although well known to the Jedmet-Nasr people, who fabricated bronze chisels, daggers and fish-hooks, it was only introduced to Egypt at the time of the Hyksos conquest a millennium and a half later. Lead, although found in metallic form both in Predynastic Egyptian graves and in the Halafian level at Arpachiyah, was mainly used in the form of galena as a cosmetic. The practice of metallurgy, quite apart from its direct technical applications, added significantly to man's empirical knowledge of chemistry and physics and was associated with the emergence of yet another class of specialized craftsmen.

For metallurgy to flourish, or even to exist in such a region as Sumer, where metal ores are entirely lacking, it was necessary to maintain an extensive system of trade. Under conditions of savagery and primitive barbarism commerce was virtually restricted to materials small in bulk and precious for their decorative or magical properties. A characteristic of the advance towards civilization was the widening of the scope of trade to include substances required for the manufacture of objects of daily use, so freeing technology from limitations imposed by local deficiencies. This tendency to draw upon an ever-widening area for raw materials, inherent in an expanding and progressive economy, was accentuated by the poverty of the alluvial zones in which civilization first developed: thus, for Sumer metal, stone and even timber, apart from the palm stems, all had to be imported from the highlands of Elam, Assyria or even further afield.

Transference of commodities in bulk necessitated means of transport more adequate than the canoes and sleds of savage origin with which the primitive barbarians had remained content. Substantial boats, built up from bundles of reeds lashed together, were used from early times both on the Nile and the Euphrates: vessels of this character

with square cabins amidships are represented on Amratian pots, propelled by a steersman and half a dozen pairs of oarsmen, and clay models from Al 'Ubaid show that

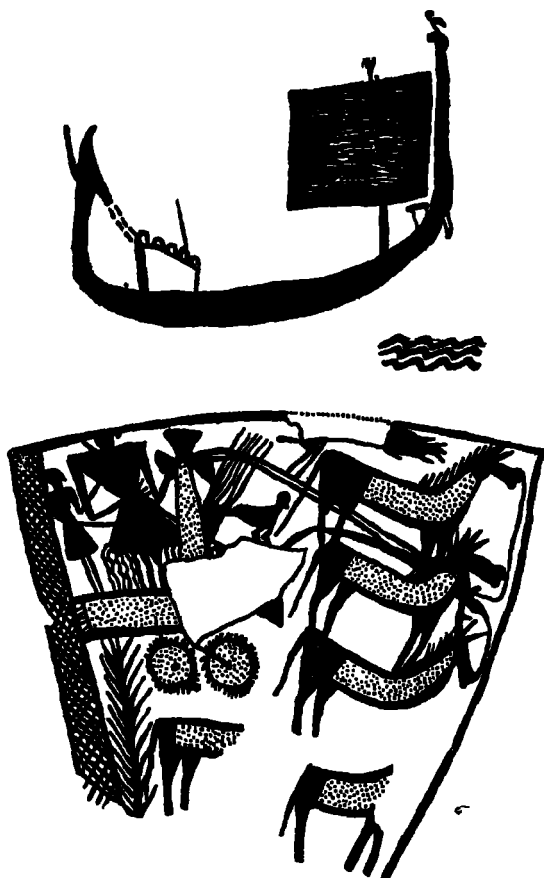


Fig. 24. Transport on the way to civilization.

Upper: 'Foreign' sailing boat painted on Gerzean pot, Egypt.

Lower: War chariot painted on pot from Khafaje, Mesopotamia. (After Childe.)

similar ones plied the Euphrates about the same time. It is too early to say when or where the idea of harnessing the wind to ships was devised, but a boat with a tall prow, upturned stern and square spread sail, depicted on a late predynastic Egyptian pot (Fig. 24), was almost certainly of Asiatic origin. In this connection it is significant that a cemetery of the same period has been found on the shore of the Red Sea at Ras Samadai and that Egyptian objects of proto-dynastic age have been recovered from the Syrian port of Byblos. It is likely that the vast bulk of merchandise was carried by water and that distribution from landing-places was effected by human portage. The harnessing of animal power to vehicles, destined to play a vital role in the later history of transport, was another Asiatic invention and was more likely evolved in the piedmont zone of Syria and Assyria than in the alluvial plain of Sumer. It is probable that oxen were the first beasts to be harnessed to vehicles and that these comprised sleds and four-wheeled carts. A clay toy representing an early version of a covered wagon was found at Tepe Gawra (VI) in an Early Dynastic level. The wheeled vehicles most commonly portrayed, because used by kings and leading men, were war-chariots drawn at first by onagers and later by horses. It may well be that equids were first harnessed to wheeled vehicles for warlike purposes. Certainly their role in war has been conspicuous. The earliest certain evidences for wheeled vehicles yet to hand are representations of chariots on painted pottery of Halafian and Jemdet Nasr character (Fig. 24) and on a cylinder seal of the Uruk period. It is significant that chariots, like bronze, made their first appearance in Egypt a millennium and a half after they were known in western Asia.

The requirements of commerce, and the extension of individual property rights from weapons, tools and personal trinkets to the accumulations of food and treasure made possible by settled farming, stimulated conceptual innovations and social readjustments, which in turn served to

heighten the tempo of economic life. Measurement, accounting and law were quite as vital to the new economy as wheels or sails. In the case of natural entities, such as the shells, fish or game handled by savages, counting sufficed to convey an adequate idea of quantity, and storage jars of standard size served as units of measurement for farming products like corn, beer, oil or wine; but for metals, which in their native state could neither be counted nor, unless as alluvial dust, poured and at the same time were precious in relation to their bulk, it was necessary to devise an accurate method of estimation by weight. The idea of the simple counterpoise balance and weights was devised at an early date. Limestone weights and a stone cross-bar were recovered by Petrie from Amratian graves.

The development of individual property and the great extension of trade in commodities made it necessary to devise a method of indicating ownership personal to the proprietor and yet easily identifiable. The solution adopted in western Asia was the engraved seal, suspended on a thread and worn round the owner's neck. The commonest form in Sumer was the cylinder seal, (Pl. IV), generally perforated axially, which first appeared during the Uruk stage, while in Syria (Tell Halaf) and Iran (Sialk III, Susa I and Hissar I) the button seal with perforated loop was in general use. In the ancient east the commonest receptacle for storing valuables was the earthenware jar and this was often covered by linen or skin stretched across the mouth and held in place by clay packed round the neck: one of the main functions of the seal was to stamp the clay plug with the mark of ownership.

To judge from the earliest texts, the origin of writing lay in the hum-drum necessities of accountancy rather than in any aspirations of the human spirit. The earliest scribes occupied themselves with recording property, offerings and taxes, or with school texts for training up successors in the task of inscribing sums of material accumulation.

The earliest collection of documents brought to light by archæology" comprises the archives from the 'Red Temple' of Erech, dating from the Uruk stage of Sumerian pre-history. The script was pictographic, the symbols denoting the objects which they depict in abbreviated form, primitive ideograms little removed from the conventionalized renderings of animal forms engraved by Upper Palæolithic man. It was not until Jemdet Nasr times that we find in the palace accounts indications of writing, in which pictorial symbols have been invested with phonetic values, spelling words as well as denoting ideas. Besides representing objects and persons, the earliest scribes had also to indicate number. In the 'Red Temple' records two systems of numeral notation were employed, one decimal (1-10-100), associated with Elam, and the other sexagesimal (1-10-60-3600), characteristically Sumerian. Documents were commonly signed and witnessed by the impression of a seal, for it must be remembered that the majority of people were illiterate: the scribe, like the smith or the seal-engraver, was another of the products of economic specialization.

, Increased density of settlement, the undertaking of large-scale communal activities like irrigation and harvesting, more intense economic specialization and a more widely flung trade, all helped to complicate social structure and to further the integration of society. Even more potent, at least in the early stages of civilization, was man's lack of confidence in his own arrangements and devices: paradoxically, his anxiety and yearning for external aid grew in proportion as he mastered natural forces. As means of subsistence improved, population outstripped and left far behind the possibilities of natural food-supply. Thus man advanced only at the cost of burning his boats: whereas to a primitive barbarian farming was still something of a luxury, to dwellers in populous communities on the threshold of civilization, the successful performance of a vastly more complex series of economic processes from

agriculture to distant trade was a necessity of life, mitigated only by increased capacity for accumulation and storage and improved facilities for transport. As the basis of existence became increasingly artificial, so the need to promote self-confidence grew more pronounced, a requirement satisfied along the distinct but convergent lines of religious belief and social integration.

Appreciation of the power of unseen forces, and the desire to enlist them on his side, grew more and not less intense as the machinery of life increased in complexity, and it is significant that the period of transition from barbarism to civilization was one of great development in the sphere of religion. The desire to promote success and avert evil by maintaining proper relations with powers beyond human control was in itself deep rooted: we know from his magical art that Upper Palæolithic man endeavoured to ensure his economic success by observances and practices, which though of no material effect, had a profound influence on morale and so on performance. From such indications as figurines of women and domesticated animals it is evident that the earliest farmers were preoccupied with the sources of fertility and increase, on which their economy was based, but it is significant that the cult of the Mother Goddess in its developed form was a function, not of barbarism, but of civilization. Broadly speaking the development was from domestic cult to community religion, from household shrine to public temple. Science, whereby man attained to an understanding of causal relations between natural phenomena and so achieved confidence through knowledge rather than faith, was a later fruit of civilization, though its origins, in the form of empirical knowledge acquired in the course of cultural evolution, go back to the beginning of hominid history.

Already by the Uruk stage in Sumer the economic surplus was sufficient to erect temples and maintain priests, the latter in themselves, as, professional servants of the

gods whose wishes they made known to their fellow men, a notable instance of specialization. The exploration of Warka (Erech) has revealed a series of temple structures from the Uruk period. Two temple complexes were brought to light by the excavators, one dedicated to Anu or his precursor, the other to Ea. Each probably consisted of a holy mountain or ziggurat with a high temple on a platform on the summit, approached by stairs from a lower and larger temple at ground level. Down these steps the god was able to descend to meet his votaries in the lower temple, withdrawing to his house on the crown of the holy mountain. Neither of the two temple-complexes had survived complete, but enough has been revealed to show that both had been remodelled and even rebuilt several times during the Uruk period. Layers of bitumen, each representing an outer coating of Anu's mountain, show that the ziggurat was heightened several times before the White Temple, made of square mud-bricks, white-washed on the outside, was erected on its summit. A final heightening of the mountain masked the White Temple and so preserved it for posterity. Ea's ziggurat was so masked by a later Kassite edifice that only the lower temples could be fully explored. Replacing an earlier one, the excavators found a gigantic building resting on foundations of limestone, every block of which had to be imported from a distance. In due course this Limestone Temple was replaced by the Red Temple, mentioned earlier in this chapter, and which in turn was remodelled at least three times before the end of the Uruk period. From the care lavished on the construction of these temples and on their frequent reconstruction it is evident that they played a role of great significance in Uruk society. Not only did they shelter the scribes and learned men of the day, on whom intellectual progress so largely depended, from the burden of manual labour, but through their service they guaranteed the security and well-being of the community.



Plate IV. Impression of Early Dynastic cylinder seal from Mesopotamia, depicting the feeding of the temple herd (After Seton Lloyd)

The final development which ushered in civilization was the rise of royal dynasties and the inception of unified territorial States. In Sumer the new era was presaged by the royal palace of Jemdet Nasr and in Egypt by the development of tombs from the simple trench grave to the solid brick-built *mastabas* of the First Dynasty, and thence to the culminating pyramids of the Fourth and Fifth. The earliest kings retained many of the functions of priests and even claimed, as their earthly tenants, some of the attributes of gods. Yet it is as temporal rulers, as incarnations of the State integrated on a territorial basis, that they contributed most to the evolution of civilization, and this temporal power of kings was powerfully stimulated by war.

At a stage of savagery or primitive barbarism, sparseness of settlement reduced the likelihood of conflict between different communities, while poverty shortened the duration, and the relative ineffectiveness of armament mitigated the severity of any minor brushes that might occur. Every one of the factors contributing to the rise of civilization, on the other hand, served to increase the probability of conflict, and war itself, tapping in the instinct of self-preservation one of the deepest springs of life, called forth to the full the latent energies of mankind, speeding up the rate of technical development and intensifying the integration of society. The closer settlement became, the more sharply were frontiers defined, and the greater the material progress in the richer lands, the stronger the inducement to break in from the poorer ones. Conversely, it was characteristic of advanced societies to reach out beyond the frontiers to more distant markets and sources of raw materials. This not only involved persistent 'colonial wars' at the expense of barbarian or less highly civilized neighbours, but also led to major wars between rival imperialisms on the same level of cultural development. At the same time technical progress constantly improved the material apparatus of slaughter—metallurgy gave

keener and tougher weapons and chariots increased the mobility of the warrior—while an ever-growing population served to fill the ranks.

War has thus played a dual role in the evolution of civilization, having been in part the consequence and in part the cause of cultural advance. Throughout history, indeed, success in war has been the prize of civilization. The most advanced communities are ultimately those which survive. Technical superiority gives the means for survival and only by surviving can a community inherit the newest developments of an advancing technology. The noble savage, the proud and vigorous barbarian, the cultured citizen, all have bowed the neck to the lethal onslaught of enemies superior in the means of taking life. The advance of technique provides ever more effective instruments, but it is men who decide how these shall be used. The capacity to destroy has grown as rapidly as the ability to build. Only by conscious and determined resolve to control technology through institutions designed to secure the well-being of all, can man hope to reap the benefit of his age-long martyrdom. Mankind today is menaced as never before by the products of human ingenuity and skill. True it is that human destiny is moulded by 'the seeing eye, the understanding ear, and the skilful hands'—of man.

HIGHER SAVAGERY	BARBARISM	CIVILIZATION	
Hunting, fishing and gathering		Irrigation	Subsistence
	Primitive farming	Traction plough	
Seasonal camps		City	Settlement
	Village		
Dwellings of wood, reeds, mud, etc		Stone & brick	Buildings
		Public edifices temples, palaces	
Hunting bands	Peasant communities		Society
		Craftsmen	
		Merchants	
		Priests	
		Kings	
Flaking, grinding & perforation of stone		Metallurgy	Industry
	Hand-made pottery	Wheel-made pottery	
	Weaving		
Precious substances, magical and-or decorative		Bulk commodities	Trade
		Scales	
Paddle or rowing craft		Sails	Transport
Sliding equipment, sleds, sledges, skis		Wheeled vehicles	
Personal adornment			Intellectual & esthetic
Art		Seals	
		Writing	
Ceremonial burial			

Table II

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